HYDROTERRA TECHNOLOGIES, LLC
LAND SURVEY AND HYDROGRAPHIC SOLUTIONS

SURVEY METHODOLOGY REPORT

June 1, 2017

STATE OF LOUISIANA
COASTAL PROTECTION AND RESTORATION AUTHORITY (CPRA)

TOPOGRAPHIC AND MAGNETOMETER SURVEYS OF THE CAMINADA HEADLANDS BACK BARRIER MARSH CREATION INCREMENT II PROJECT (BA-193)

LAFOURCHE AND JEFFERSON PARISHES, LOUISIANA

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Project Overview

The Caminada Headland has experienced some of the highest shoreline retreat rates in Louisiana. Historically the shoreline has migrated landward at about 40 feet per year. Between 2006 and 2011, shoreline migration increased dramatically, exceeding 80 feet per year near Bay Champagne and 110 feet per year in the Bayou Moreau area. The increased losses occurred in the wake of Hurricanes Katrina and Rita in 2005 as the breaches remained open for an extended length of time. The losses were exacerbated by Tropical Storm Fay and Hurricanes Gustav and Ike in 2008. Significant prolonged breaches greatly increase the net export of sediment from the headland.
In addition to the shoreline migration, the area is also experiencing high loss rates of interior marshes. As the beach and dune continue to migrate landward, overwashed sediment will be lost into newly formed open water and land loss rates will be exacerbated. The continued deterioration of Caminada headland threatens thousands of acres of wetland habitat as well as critical infrastructure, including Port Fourchon, LA Highway 1, and the lower Lafourche levee system.

The goals of this project are to:
1) Create and/or nourish 444 acres of back barrier marsh, by pumping sediment from an offshore borrow site;
2) Create a platform upon which the beach and dune can migrate, reducing the likelihood of breaching, improving the longevity of the barrier shoreline, and protecting wetlands and infrastructure to the north and west. The proposed project is expected to slow the current trend of degradation in the headland.

This project would create 246 acres of back barrier intertidal marsh and nourish 198 acres of emergent marsh using material dredged from the Gulf of Mexico. The marsh creation and nourishment cells are designed to minimize impacts on existing marsh and mangroves.
Assuming some natural vegetative recruitment, vegetative plantings are planned at a 50% density, with half planned at project year one and half planned at project year 3. Containment dikes will be degraded or gapped by year three to allow access for estuarine organisms.

The project would result in approximately 207 net acres over the 20-year project life.

The BA-193 Project is located in Lafourche and Jefferson Parishes, Louisiana, east of Port Fourchon, adjacent to the Caminada Headland (See Figure 1).

Vicinity Map

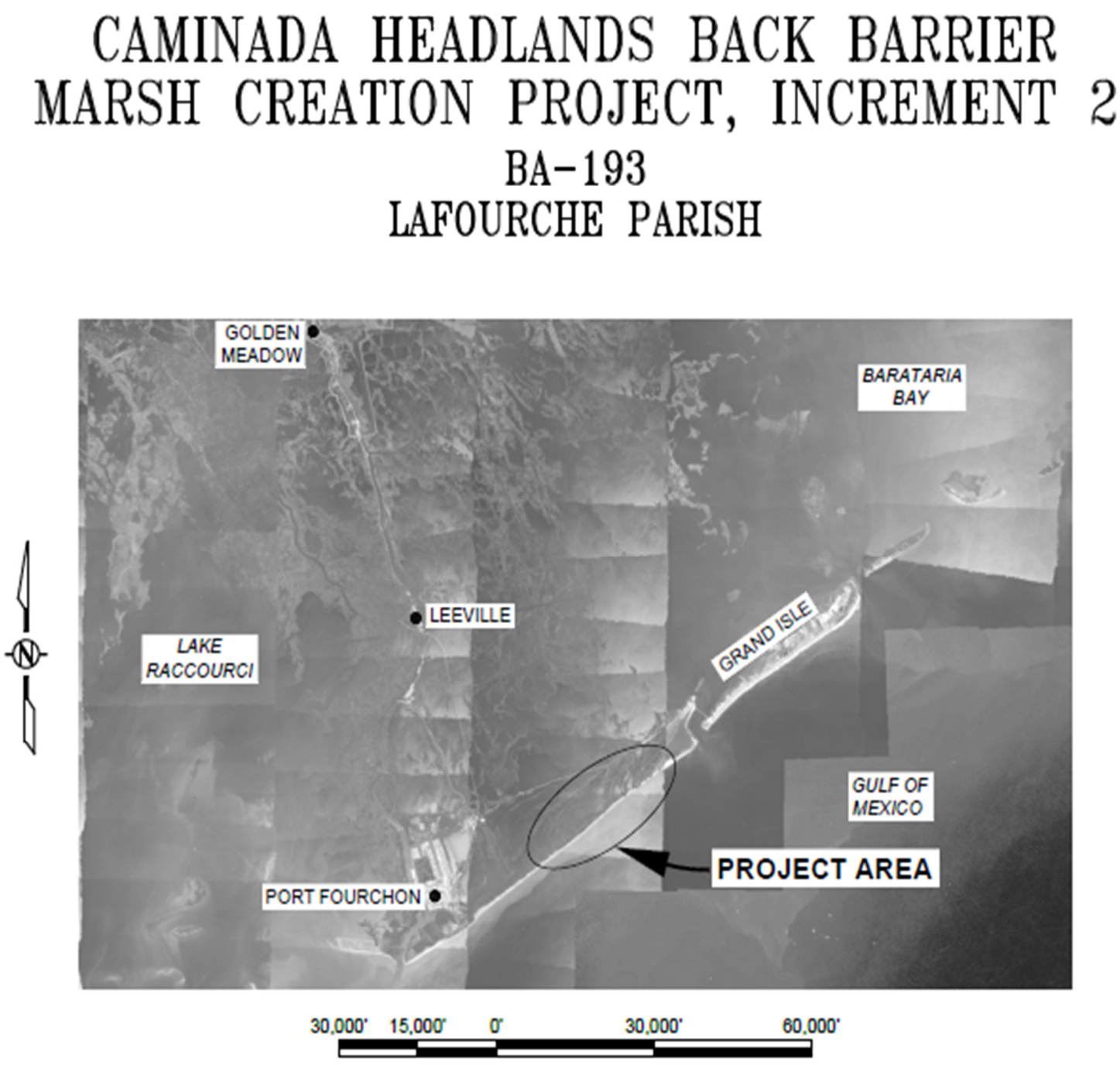

Figure 1

Project Timeline

Project #	Group	Date
BA-193	CONTACT AND SUBMIT PAPERWORK TO EDWARD WISNER DONATION TO OBTAIN ACCESS PERMISSION	01/11/2017
BA-193	OBTAIN CAILLOUET LAND, LLC ACCESS PERMISSION	01/24/2017
BA-193	PREPARE SURVEY TIME	01/26/2017
BA-193	INITIAL PROJECT SETUP	01/31/2017
BA-193	REVIEW WEISNER ACCESS AGREEMENT	02/02/2017
BA-193	LOCATE AND VERIFY SURVEY CONTROL. BEGIN SURVEY TOPOGRAPHIC SURVEY OF TRANSECTS	02/07/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/08/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 02/07/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK	02/08/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/09/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 02/08/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK	02/09/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/13/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 02/09/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK	02/13/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/14/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 02/13/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK	02/14/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 02/14/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK	02/17/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/20/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/21/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/22/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 02/20 AND 21/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK	02/22/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/23/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/24/2017

BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 02/22 AND 23/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. PROJECT MANAGEMENT.	02/24/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	02/28/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 02/24/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. PROJECT MANAGEMENT.	02/28/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS.	03/01/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 02/28/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. PROJECT MANAGEMENT.	03/01/2017
BA-193	COMPLETE TOPOGRAPHIC SURVEY OF TRANSECTS. TIE IN PIPELINE MARKER STAKES SET BY OTHERS	03/02/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 03/01/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. PROJECT MANAGEMENT.	03/02/2017
BA-193	PROCESS AND QA/QC TOPOGRAPHIC TRANSECTS FROM 03/02/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. PROJECT MANAGEMENT. CREATE MAGNETOMETER TRANSECT LINES.	03/03/2017
BA-193	PROBE PARALLEL HARVEST PIPELINES	03/06/2017
BA-193	PROBE PARALLEL HARVEST PIPELINES	03/07/2017
BA-193	PROCESS AND QA/QC FIELD DATA FROM 03/06/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. PROJECT MANAGEMENT.	03/07/2017
BA-193	PROBE PARALLEL HARVEST PIPELINES. PERFORM HEALTHY MARSH SURVEY ON 3 AREAS	03/08/2017
BA-193	PROCESS AND QA/QC FIELD DATA FROM 03/07/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. PROJECT MANAGEMENT.	03/08/2017
BA-193	PROBE PIPELINES	03/09/2017
BA-193	PROCESS AND QA/QC FIELD DATA FROM 03/08/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. PROJECT MANAGEMENT.	03/09/2017
BA-193	PROBE PIPELINES	03/10/2017
BA-193	PROCESS AND QA/QC FIELD DATA FROM 03/09/2017. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. PROJECT MANAGEMENT.	03/10/2017
BA-193	PROBE PIPELINES	03/15/2017
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BA-193	MAGNETOMETER SURVEY OF MARSH FILL AREA TRANSECTS EVERY 500’	3/21/2017
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BA-193	MAGNETOMETER SURVEY OF MARSH FILL AREA TRANSECTS EVERY 500’	03/23/2017
BA-193	MAGNETOMETER SURVEY OF MARSH FILL AREA TRANSECTS EVERY 500’	03/24/2017
BA-193	MAGNETOMETER SURVEY OF MARSH FILL AREA TRANSECTS EVERY 500’	03/27/2017
BA-193	PROBE PIPELINES AT THE WEST SIDE OF PROSPECT	03/28/2017
BA-193	PROCESS MAGNETOMETER DATA OBTAINED FROM 03/27/2017. MAPPED FOR QA/QC TO CREATE LINE FOR POSSIBLE PIPELINE PROBING. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK	03/28/2017
BA-193	PROBE PIPELINES AT THE WEST SIDE OF PROSPECT	03/29/2017
BA-193	PROCESS MAGNETOMETER DATA OBTAINED FROM 03/28 AND 29/2017. MAPPED FOR QA/QC TO CREATE LINE FOR POSSIBLE PIPELINE PROBING. PROCESS CONTROL POINT DATA USING NGS OPUS FOR CHECK. ADJUSTED ALL DATA TO GEOID 12A	03/30/2017
BA-193	PREPARE PRELIMINARY SURVEY METHODOLOGY REPORT	04/12/2017
BA-193	TIE IN CRMS 0292	04/13/2017
BA-193	CONTINUE TOPOGRAPHIC SURVEY OF TRANSECTS M196.	04/21/2017
BA-193	COMPLETE SURVEY OF TRANSECT M196	04/24/2017
BA-193	PROCESS AND QA/QC FIELD DATA FROM 04/21/2017	04/24/2017
BA-193	PROCESS AND QA/QC FIELD DATA FROM 04/24/2017	04/25/2017
BA-193	REVISE SUBMITTALS WITH CPRA COMMENTS	05/31/2017
BA-193	PREPARE FINAL SURVEY METHODOLOGY REPORT AND DELIVERABLES FOR FINAL CPRA REVIEW	06/01/2017

Section 2: Project Planning

Data Collection Reference Systems and Project Control

Horizontal Datum (Epoch): NAD 83 (CORS) Louisiana South US Feet.
Vertical Datum (Epoch): GPS derived NAVD 88 (GEOID 12A) Feet.

All surveys conducted for the project utilized the established benchmark CRMSBA-SM-19 elevation using Geoid12A to determine NAVD88 elevation. Static data was collected on CRMSBA-SM-19 and was processed with NGS-OPUS to derive the Geoid12A elevation See Appendix D for results.

Two secondary monuments "TE23-SM-01" and "CRMSBA-SM-19" were respectively within approximately 5.0 miles and 2.0 miles of the project area, and were used for horizontal and vertical control. The condition of these monuments was investigated for damage prior to the work commencing. Their station descriptions are included in Appendix A of this report. Monument TE-23-SM-01 was not occupied on this project.

Section 3: Marsh Creation Fill Area Survey

Hydroterra Technologies performed a topographic survey within the proposed marsh creation fill area. Survey transects were laid out in the open water, broken marsh, and across pipeline canals at the proposed marsh creation locations and were spaced every 250 ft as shown in Figure 2.

Transects begin at the centerline of the crown of the BA-45 & BA-143 (Caminada Headlands Beach and Dune Restoration and Caminada Headlands Beach and Dune Restoration Increment II, respectively) dune and extend a minimum of 200 ft beyond the northern boundary of the fill area. Position and elevation were recorded at a minimum every 25 ft along each transect or where elevation changes of greater than 0.5 ft occurred. An appropriate topo shoe was attached to the bottom of the survey rod to prevent the rod from sinking.

Water level elevations (NAVD88) were collected daily for the duration of all field work. These elevations were tied into the staff gage at CRMS station 0292. The location of CRMS 0292 is shown in Appendix A,

The correlated water level elevations are depicted in Appendix E in this survey report.

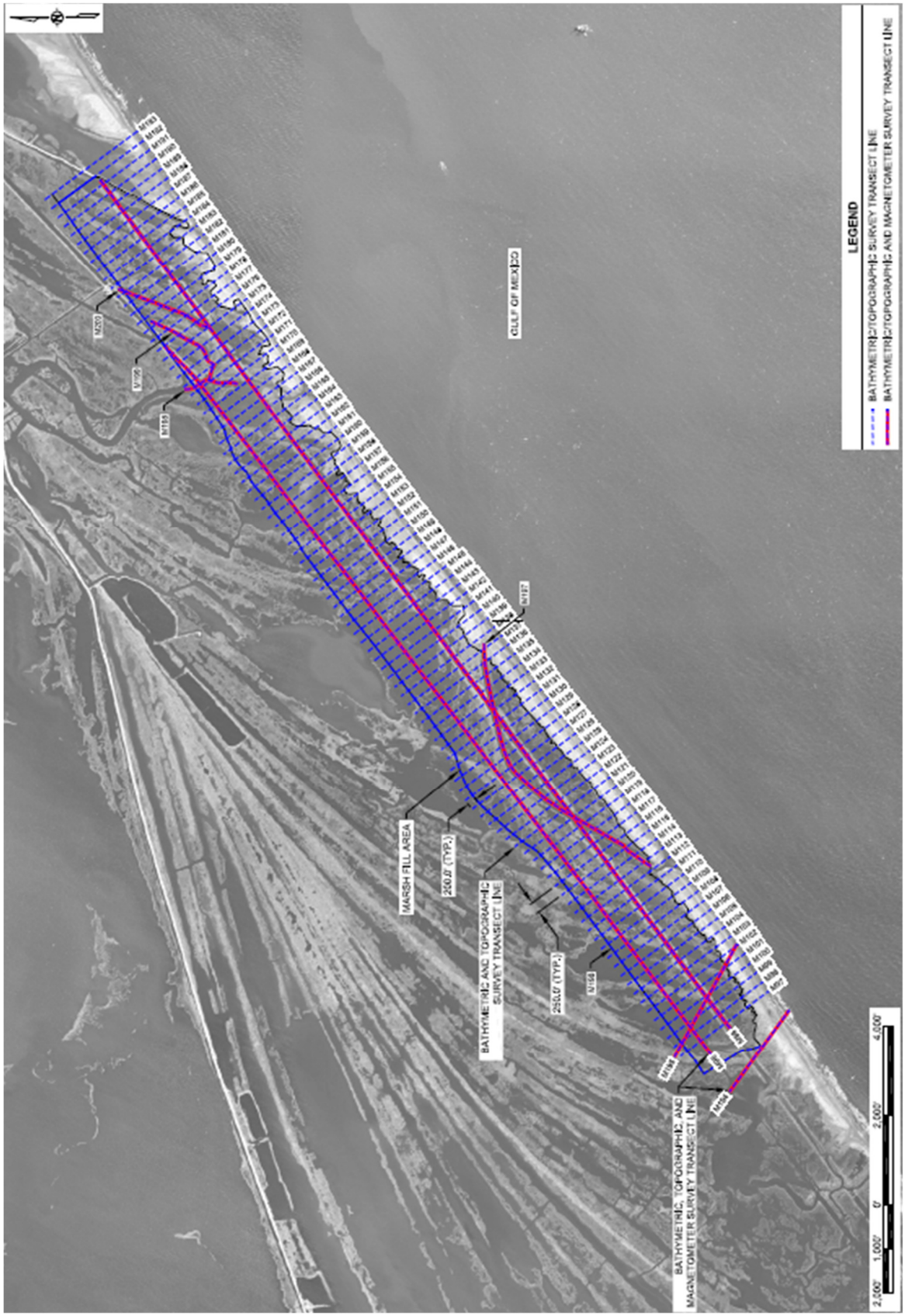

LEGEND
BATHYMETRIC/TOPOGRAPHIC SURVEY TRANSECT LINE
BATHYMETRIC/TOPOGRAPHIC AND MAGNETOMETER SURVEY TRANSECT LINE
GULF OF MEXICO
MARSH FILL AREA
250.0' (TYP.)
250.0' (TYP.)
BATHYMETRIC AND TOPOGRAPHIC SURVEY TRANSECT LINE
BATHYMETRIC, TOPOGRAPHIC AND MAGNETOMETER SURVEY TRANSECT LINE
2,000' 1,000' 0' 2,000' 4,000'

Figure 2

Equipment

Equipment utilized during survey:

- One (1) Trimble Survey Grade RTK System including but not limited to 5700, R7, R8-2, R8-3 and R-10 Receivers (Includes Base and Rover and accessories).
- One (1) Fixed Height Aluminum Rod (8' or 10' in length) with a 6" diameter metal plate as the base of the rod.
- One (1) Airboat

The manufacturer's specification sheet can be found in **Appendix B** at the end of this document.

Field Data Acquisition Methodology

Survey Control

The survey began with the location and verification of the project survey monument CRMSBA-19-SM. Once the project monument was located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Data Acquisition

Transects began at the centerline of the crown of the BA-45 & BA-143 (Caminada Headlands Beach and Dune Restoration and Caminada Headlands Beach and Dune Restoration Increment II, respectively) dune and extended a minimum of 200 ft beyond the northern boundary of the fill area. Position and elevation were recorded at a minimum every 25 ft along each transect or where elevation changes of greater than 0.5 ft occurred. An appropriate topo shoe was attached to the bottom of the survey rod to prevent the rod from sinking.

Data Processing

All topographic data was processed using Trimble's Geomatics Office software version 1.62.

All processed data was represented visually using an AutoCAD Civil 3D software version specified in the specifications for analysis.

Section 4: Healthy Marsh Survey

An average healthy marsh elevation (NAVD88) survey was performed at three healthy marsh elevation sites as determined by CPRA. The average healthy marsh elevation is defined as the point where a survey rod is resting among living vegetative stems and is supported by soil containing living vegetative roots. It was not necessary to cut vegetative stems to get a valid survey shot.
Specification stated "A minimum of twenty (20) elevations (each one separated by 20 to 40 ft) at each of the three (3) sites were required for this determination." After consulting with the CPRA representative Todd Hubbell who was present during the time of the healthy marsh elevation survey, it was decided that a circular pattern and transects around each site would be performed.

Equipment

Equipment utilized during survey:

- One (1) Trimble Survey Grade RTK System including but not limited to 5700, R7, R8-2, R8-3 and R-10 Receivers (Includes Base and Rover and accessories)
- One (1) Fixed Height Aluminum Rod (8' or 10' in length) with a 6" diameter metal plate as the base of the rod.
- One (1) Airboat

The manufacturer's specification sheet can be found in **Appendix B** at the end of this document.

Field Data Acquisition Methodology

Survey Control

The survey began with the location and verification of the project survey monument CRMSBA-19-SM. Once the project monument was located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Data Acquisition

A circular pattern and transects around each site was surveyed as directed by the CPRA representative Todd Hubbell.

Data Processing

All topographic data was processed using Trimble's Geomatics Office software version 1.62.

All processed data was represented visually using an AutoCAD Civil 3D software version specified in the specifications for analysis.

Section 5: Magnetometer Survey

A magnetometer survey was performed in the fill area (Blue Lines) and pipeline canals (Purple Lines) as shown in Figure 3, to locate any pipelines or obstructions in the area.
If a pipeline was detected, Hydroterra Technologies probed to the pipeline and determine the depth of cover and the elevation of the top of the pipeline. The pipeline locations were shown in plan and profile view on 11" x 17" layout(s).

Equipment

Equipment utilized during survey:

- One (1) Trimble Survey Grade RTK System including but not limited to 5700, R7, R8-2, R8-3 and R-10 Receivers (Includes Base and Rover and accessories)
- One (1) Sub Surface MUL 1 Magnetic Underwater Locator.
- Geometrics G-882 Cesium Magnetometer.
- One (1) Fixed Height Aluminum Rod (8' or 10' in length) with a 6" diameter metal plate as the base of the rod.
- One (1) Airboat

The manufacturer's specification sheet can be found in **Appendix B** at the end of this document.

Field Data Acquisition Methodology

Survey Control

The survey began with the location and verification of the project survey monument CRMSBA-19-SM. Once the project monument was located, visually inspected for integrity, and deemed undisturbed and suitable for use, a base receiver was then set on the monument.

Data Acquisition

A magnetometer survey was performed in the fill area (Blue Lines) and pipeline canals (Purple Lines) as shown in Figure 3, to locate any pipelines or obstructions in the area.
If a pipeline was detected, Hydroterra Technologies probed to the pipeline and determine the depth of cover and the elevation of the top of the pipeline. The pipeline locations were shown in plan and profile view on 11" x 17" layout(s). A Geometrics G-882 Cesium Magnetometer and a Sub Surface MUL 1 Magnetic Underwater Locator was utilized for the magnetometer survey.

Data Processing

All topographic data was processed using Trimble's Geomatics Office software version 1.62.

All Magnetometer data was processed using the Hypack© 2017 Magnetometer Editor software.

All processed data was represented visually using an AutoCAD Civil 3D software version specified in the specifications for analysis.

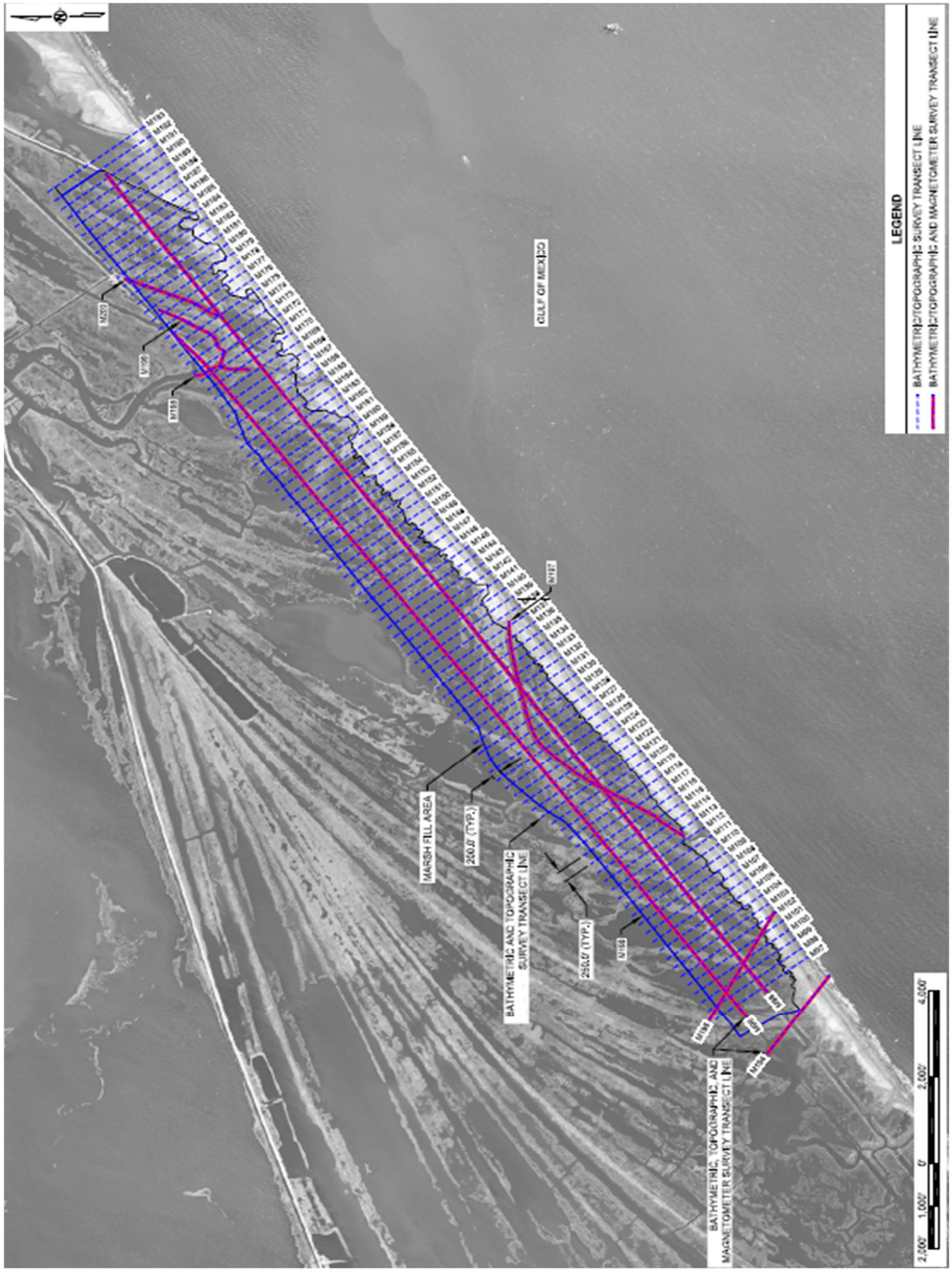


Figure 3

Section 6: Deliverables

Preliminary Submittals

In addition to the deliverables requested in this scope of services, two sets of 11" x 17" preliminary drawings were delivered to Renee Bennett for technical review and comment before the remaining deliverables were finalized.

All preliminary and final deliverables were sent to the following address:
Renee Bennett
CPRA Project Manager
Coastal Protection and Restoration Authority
150 Terrace Street
Baton Rouge, LA 70802
(225)-342-4592
renee.s.bennett@la.gov

Engineering Deliverables

- One (1) set of draft survey drawings was submitted to CPRA via email in AutoCAD format for Acceptance before the survey report was finalized.
- Two (2) bound hard copies of the final survey report, data, and drawings were submitted to CPRA after Acceptance of the draft survey drawings. Each spiral-bound report included one (1) digital copy of the final survey report (Adobe PDF), data (Microsoft Excel), and drawings (AutoCAD 2015 or later edition) on compact disk.
- The survey report documented the survey methodology employed in the field, survey control, calibrations, field equipment, field records, and all other pertinent information.
- All survey data was provided in tables which include separate columns for the associated point number, northing coordinate, easting coordinate, elevation and description. Each individual transect was included in a separate Excel tab. Magnetometer survey data also included the amplitude, duration, and description for the probable cause of all magnetic anomalies. Magnetometer survey data of all pipelines included a separate column for the elevation of the top of pipe.
- The survey drawings conformed to CPRA drafting standards, utilize half size (11"x17") borders, and include the following information:
    - Project name and number on all sheets;
    - All elevations referenced to NAVD88;
    - All horizontal coordinates referenced to the Louisiana State Plan Coordinate System South Zone, NAD83;
    - Overlay all boundaries of project construction features in plan view;
    - The location of all secondary survey monuments and temporary benchmarks plan view;
    - Transects and profiles shown in plan and profile and include mean high and mean low water levels;
    - Spot elevations shown or appropriately represented in plan view;
    - Topography represented in plan view using +/-1.0 foot contours;
    - Magnetometer survey track lines and readings shown in plan view.

LASARD Deliverables

CPRA maintains the Louisiana Sand Resources Database (LASARD) Program to help facilitate the identification and management of nearshore, offshore and riverine sediment resources. The LASARD database is also used to manage, archive, and maintain geological, geophysical, topographic, bathymetric, geotechnical and other related data pertaining to the exploration of sand/sediment in various environments.
LASARD Deliverables were submitted to CPRA electronically or on a compact disc in the data format following protocols defined in the LASARD SOP for acceptance before the survey report was finalized.

One digital copy of the final LASARD deliverables was submitted to CPRA after acceptance of the draft LASARD deliverables on compact disc. The compact disc(s) included one (1) digital copy of the final LASARD deliverables as defined by the Attribute Specifications and LASARD GIS templates provided by CPRA.

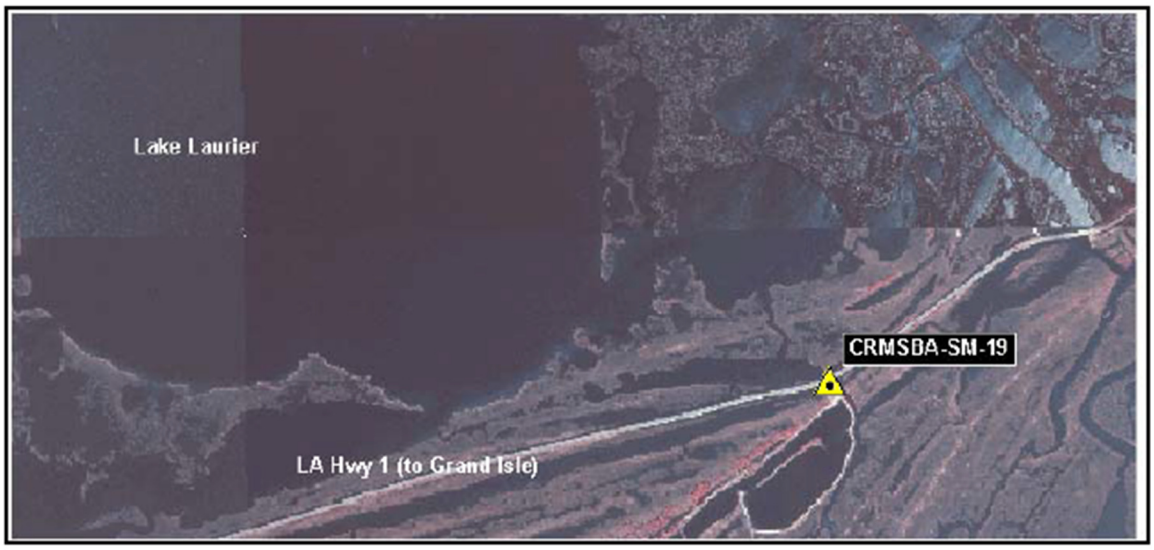
Certification

All survey deliverables were certified, signed, and sealed by a professional land surveyor licensed in the State of Louisiana.

Hydroterra Technologies prepared and delivered one (1) draft copy of the deliverables (excluding the inserted CD) described above to CPRA. This draft copy was sent to the following CPRA representative for review:
Renee Bennett
CPRA Project Manager
Coastal Protection and Restoration Authority
150 Terrace Street
Baton Rouge, LA 70802
(225)-342-4592
renee.s.bennett@la.gov

Drafts were reviewed by CPRA and two (2) final deliverables were delivered to CPRA two weeks after receipt of comments.

APPENDIX A SURVEY CONTROL SHEET



VICINITY MAP Scale: 1" = 2000' Reproduced from USC&GS "CAMINADA PASS" Quadrangle

Station Name: CRMSBA-SM-19

Monument Location: From the intersection of LA Hwy 1 and Bayou Lafourche crossing in Leeville, LA, go south +/- 11.60 miles to the monument on the south side of Hwy 1.

Monument Description: The monument is located +/- 30' south of Hwy 1 and +/- 24' west of the centerline of a limestone driveway. The monument is a 9/16" steel rod driven to refusal within a 6" PVC sleeve set in concrete with protective metal access cover stamped **CRMSBA-SM-19.**

Date: August 2005

Monument Established By:
Chustz Surveying, Inc. for
Louisiana Department of
Natural Resources

Adjusted NAD 83 Geodetic Position*
Lat. 29°10'55.10245"N
Long. 90°06'03.20359"W

Adjusted NAD 1983 Datum* LSZ (1702) Feet
N= 250130.91
E= 3674132.89

Adjusted NAVD88 (Feet) /Geoid99*
Elevation = 3.46

* As surveyed for LaDNR CRMS project, contract NO: 2503-05-56

VICINITY MAP Not to Scale

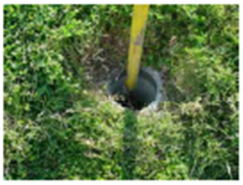
Image Reproduced from Google Earth Pro ©2008 Google™

Station Name: TE23-SM-01

Monument Location: This Station is located southeast of Port Fourchon, 40 feet east of the centerline of La Hwy. 3090 and 65 feet northeast of the bridge approach near Pass Fourchon, Louisiana.

Monument Description: NGS Style floating sleeve monument; 9/16" stainless steel rods driven 96 feet to refusal, set in a sand filled 6" PVC pipe with access cover set flush with the ground.

Stamping: "TE23 SM 01"



Re-Adjusted: May 2008

Monument Established By: Morris P. Hebert, Inc.

Adjusted NAD83 Geodetic Position (NSRS2007)
Lat. 29° 06' 42.28538"N
Long. 90° 11' 26.96472"W

Adjusted NAD83 Datum LSZ (1702) Ft (NSRS2007)
N= 224,296.40
E= 3,645,688.72

Adjusted NAVD88 Height (2006.81)
Elevation = 7.61 feet (2.321 mtrs)

Ellipsoid Hgt: -21.546 mtrs
Geoid03 Hgt: -23.867 mtrs (2004.65)

FOR REFERENCE ONLY
LCZ Adjusted NAVD88 Height (Geoid99)
Elevation = 8.21 feet (2.502 mtrs)

Adjusted position determined by John Chance Land Surveys, Inc. for the Louisiana Department of Natural Resources, CRD

VICINITY MAP: Scale: 1" = 2000'

2013 NAIP imagery provided by USDA Farm Service Agency

Station Name: CRMS0292-SG-H01

Location: Near the west bank of Bayou Lafourche, approximately 2 miles north of Port Fourchon, in Lafourche Parish, LA.

Gauge Description: The gauge is a ceramic coated tide gauge attached to a 4" x 4" Treated Post.

Date Of Survey: June 2014

Staff Gauge

NAD 83 Geodetic Position:
Lat. 29°08'29.021" N
Long. 90°13'43.135" W

UTM, NAD 83, Meters (Zone 15) Coordinates
N= 3,226,827.98
E= 769,616.92

NAD 83 Datum LSZ (1702) Feet
N= 234,959.4
E= 3,633,505.8

Top of 4" x 4" Post Elevation - NAVD 88 (2011)
3.34 feet Geoid12A
4.10 feet Geoid 99

Top of Nail Shank Elevation - NAVD 88 (2011)
2.00 feet Geoid12A
2.76 feet Geoid 99

Position Determined by using Real-Time Kinematic (RTK) survey from Secondary GPS Monument "TE23-SM-01"
Position established by T. Baker Smith, LLC for the Coastal Protection and Restoration Authority.

APPENDIX B EQUIPMENT DATA SHEETS

TRIMBLE R8 GNSS SYSTEM

KEY FEATURES

Advanced satellite tracking with **Trimble 360 receiver technology**

Includes Trimble Maxwell 6 chips with **440 channels**

Unmatched GNSS tracking performance

Web user interface and remote configuration

Base and rover communications **options to suit any application**

THE INDUSTRY LEADING TOTAL GNSS SOLUTION

The Trimble® R8 GNSS system has long set the bar for advanced GNSS surveying systems. Through advanced Trimble 360 tracking technology and a comprehensive set of communication options integrated into a flexible system design, this integrated GNSS system delivers industry-leading performance. For surveyors facing demanding RTK applications, the Trimble R8 is an invaluable GNSS partner.

TRIMBLE 360 RECEIVER TECHNOLOGY

Future-proof your investment

Powerful Trimble 360 receiver technology integrated in the Trimble R8 supports signals from all existing and planned GNSS constellations and augmentation systems providing unmatched GNSS tracking performance. With this leading-edge technology, it is now possible for surveyors to expand the reach of their GNSS rovers into areas that were previously too obscured, such as under trees and in dense urban areas.

With two integrated Trimble Maxwell™ 6 chips, the Trimble R8 offers an unparalleled 440 GNSS channels. Also capable of tracking carrier signals from a wide range of satellite systems, including GPS, GLONASS, Galileo, BeiDou (COMPASS), and QZSS, the Trimble R8 provides a robust solution for surveyors.

The CMRx communications protocol in the Trimble R8 provides unprecedented correction compression for optimized bandwidth and full utilization all of the satellites in view, giving you the most reliable positioning performance.

Designed with the future in mind, Trimble 360 technology is optimized to receive future planned signals as the number of available satellites continues to grow. With Trimble 360 technology, the Trimble R8 delivers business confidence with a sound GNSS investment for today and long into the future.

FLEXIBLE SYSTEM DESIGN

The Trimble R8 combines the most comprehensive feature set into an integrated and flexible system design for demanding surveying applications. Connect directly to the controller, receive RTK network corrections, and connect to the Internet via comprehensive communication options. With a built-in transmit/receive UHF radio, the Trimble R8 enables ultimate flexibility for rover or base operation. As a base station, the internal NTRIP caster provides you customized access[1] to base station corrections via the Internet.

Trimble's exclusive Web UI™ eliminates travel requirements for routine monitoring of base station receivers. Now you can assess the health and status of base receivers and perform remote configurations from the office. Likewise, you can download post-processing data through Web UI and save additional trips out to the field.

AN INDUSTRY LEADING FIELD SOLUTION

If you're seeking the industry leading field solution, pair the Trimble R8 GNSS receiver with one of our powerful Trimble controllers, such as the Trimble TSC3, Trimble CU or Trimble Tablet Rugged PC featuring Trimble Access™ field software. These rugged controllers bring the power of the office to the field through an intuitive Windows-based interface.

Trimble Access field software offers numerous features and capabilities to streamline the flow of everyday surveying work. Streamlined workflows such as Roads, Monitoring, Mines, and Tunnels—guide crews through common project types and allows crews to get the job done faster with less distractions. Survey companies can also implement their unique workflows by taking advantage of the customization capabilities available in the Trimble Access Software Development Kit (SDK).

Need to get data back to the office immediately? Benefit from real-time data sharing via Trimble Access Services, now available with any valid Trimble Access maintenance agreement.

Back in the office, seamlessly transfer your field data using Trimble Business Center. Edit, process, and adjust collected data with confidence.

The Trimble R8 GNSS system—the industry leader for GNSS surveying applications.

1 Cellular modem required.

Trimble.

DATASHEET

TRIMBLE R8 GNSS VRS ROVER

KEY FEATURES

Proven GNSS technology from Trimble

Internal GSM/GPRS modem for fast Internet connection and data transfer

Lightweight, ergonomic, and cable free

Designed to optimally support the Trimble GNSS infrastructure solution

The Trimble® R8 GNSS VRS™ Rover is a multi-channel, multi-frequency GNSS (Global Navigation Satellite System) receiver, antenna, and data-link radio combined in one compact unit. The VRS rover combines advanced receiver technology with a proven system design to provide maximum accuracy and productivity.

TRIMBLE R-TRACK TECHNOLOGY FOR COMPREHENSIVE GNSS SUPPORT

Powered by an enhanced RTK engine, Trimble R-Track™ technology in the Trimble R8 GNSS VRS Rover supports the modernized GPS L2C and L5 signals as well as GLONASS L1/L2 signals. This extensive GNSS support is capable of providing surveying professionals with real field benefits.

With the world's GNSS' in constant development, surveying businesses small and large can be confident that investment in a Trimble GNSS system is protected. Trimble, already proven in GPS technology, will continue to lead the industry in GNSS support.

PROVEN SYSTEM DESIGN

From its powerful Trimble field software and controller to the receiver itself, the Trimble R8 GNSS VRS Rover's overall design has been tried, tested, and proven. It's rugged, lightweight and cable free for unsurpassed ergonomics and productivity in the field. Additionally, the Trimble R8 GNSS VRS rover consumes very little power and includes internal memory. These features also assist you in the field, enabling you to work longer without changing batteries or transferring data.

The Trimble R8 GNSS VRS Rover works optimally with Trimble controllers such as the Trimble CU or Trimble® TSC2® controller. Both controllers run industry-standard Microsoft® Windows™ operating systems, which are familiar and easy to use. They are also flexible for running both Trimble field software and other specialized applications.

The VRS rover includes an internal GSM/GPRS cell modem for wireless connection to the Internet via NTRIP (Networked Transport of RTCM via Internet Protocol). Quickly and easily access GNSS data from a Trimble GNSS infrastructure solution over the Internet. No additional cellphone or external modem is required.

AN IMPORTANT COMPONENT OF A TRIMBLE GNSS INFRASTRUCTURE SOLUTION

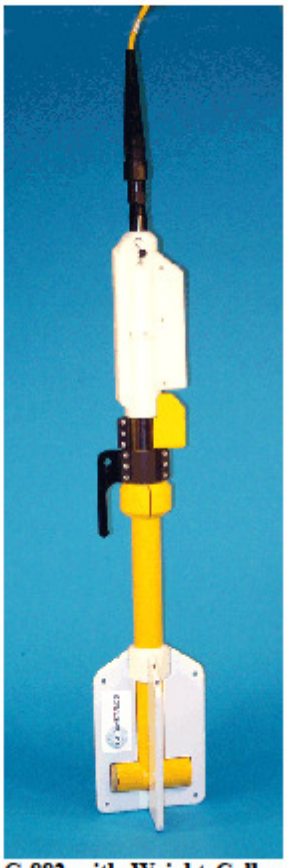
Trimble® GNSS Infrastructure is the most established and widely used GNSS infrastructure solution available. Additionally, all components of Trimble GNSS infrastructure—including the Trimble R8 GNSS VRS Rover—are designed to work together. This means the solution is scalable; that is, it will grow with you as your business needs change. And the solution is part of Trimble's Connected Site model, where products, techniques, services, and relationships combine to take your business to all-new levels of achievement.

With numerous fully modeled networks all over the world and dedicated GNSS infrastructure engineers on hand to support your unique needs, Trimble GNSS infrastructure solutions are always a wise investment. Surveying professionals like you can rely on Trimble's experience and expertise in this field, and be confident that choosing a Trimble GNSS infrastructure solution is the right decision.

Trimble

G-882 MARINE MAGNETOMETER

- ***CESIUM VAPOR HIGH PERFORMANCE – Highest detection range and probability of detecting all sized ferrous targets***
- ***NEW STREAMLINED DESIGN FOR TOW SAFETY – Low probability of fouling in lines or rocks***
- ***NEW QUICK CONVERSION FROM NOSE TOW TO CG TOW – Simply remove an aluminum locking pin, move tow point and reinsert. New built in easy carry handle!***
- ***NEW INTERNAL CM-221 COUNTER MODULE – Provides Flash Memory for storage of default parameters set by user***
- ***NEW ECHOSOUNDER / ALTIMETER OPTION***
- ***NEW DEPTH RATING – 4,000 psi !***
- ***HIGHEST SENSITIVITY IN THE INDUSTRY – 0.004 nT/√Hz RMS with the internal CM-221 Mini-Counter***
- ***EASY PORTABILITY & HANDLING – no winch required, single man operation, only 44 lbs with 200 ft cable (without weights)***
- ***COMBINE TWO SYSTEMS FOR INCREASED COVERAGE – Internal CM-221 Mini-Counter provides multi-sensor data concatenation allowing side by side coverage which maximizes detection of small targets and reduces noise***



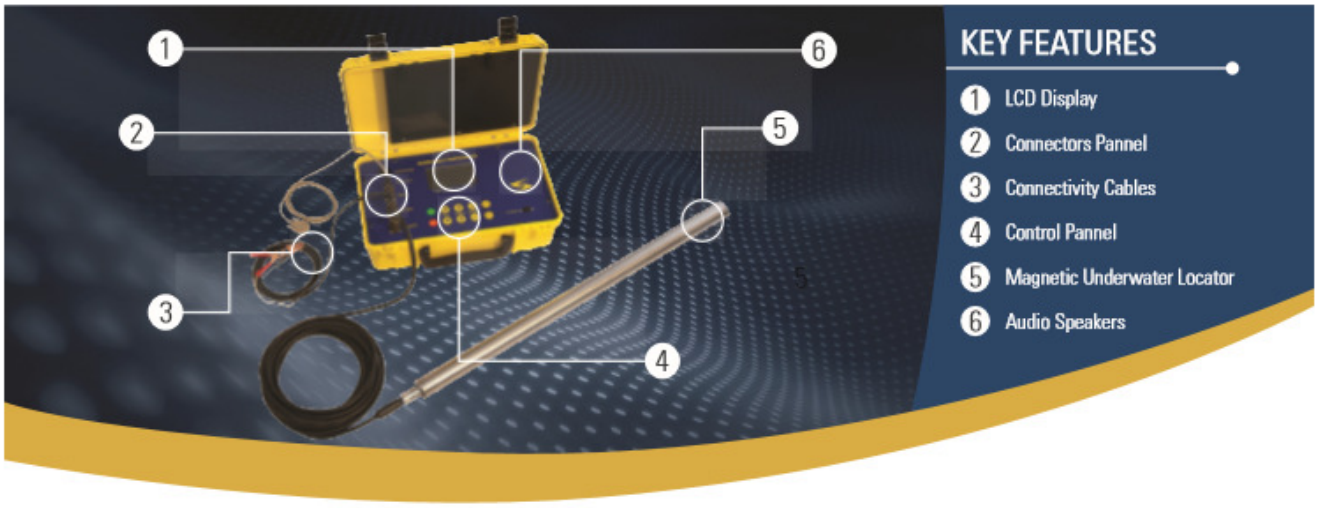
G-882 with Weight Collar Depth Option & Altimeter

Very high resolution Cesium Vapor performance is now available in a low cost, small size system for professional surveys in shallow or deep water. High sensitivity and sample rates are maintained for all applications. The well proven Cesium sensor is combined with a unique and new CM-221 Larmor counter and ruggedly packaged for small or large boat operation. Use your computer and standard printer with our MagLogLite™ software to log, display and print GPS position and magnetic field data. The G–882 is the lowest priced high performance full range marine magnetometer system ever offered.

The G-882 offers flexibility for operation from small boat, shallow water surveys as well as deep tow applications (4,000 psi rating, telemetry over steel coax available to 10Km). The G-882 also directly interfaces to all major Side Scan manufacturers for tandem tow configurations. Being small and lightweight (44 lbs net, without weights) it is easily deployed and operated by one person. But add several streamlined weight collars and the system can quickly weigh more than 100 lbs. for deep tow applications. Power may be supplied from a 24 to 30 VDC battery power or the included 110/220 VAC power supply. The tow cable employs high strength Kevlar strain member with a standard length of 200 ft (61 m) and optional cable length up to 500m with no telemetry required.
A rugged fiber-wound fiberglass housing is designed for operation is all parts of the world allowing sensor rotation for work in equatorial regions. The shipboard end of the tow cable is attached to an included junction box or optional on-board cable for quick and simple hookup to power and output of data into any Windows 98, ME, NT, 2000 or XP computer equipped with RS-232 serial ports.

The G-882 Cesium magnetometer provides the same operating sensitivity and sample rates as the larger deep tow model G-880. MagLogLite™ Logging Software is offered with each magnetometer and allows recording and display of data and position with Automatic Anomaly Detection and automatic anomaly printing on Windows™ printer! Additional options include: MagMap2000 plotting and contouring software and post acquisition processing software MagPick™ (free from our website.)

MUL-1 MAGNETIC UNDERWATER LOCATOR



FEATURES

- Heavy-duty sensor cable acts as lanyard. 30', 50', 100' (non-standard lengths available)
- High-quality connectors and "Toilet Seat" cover over headset jack. "Seacon" connectors available.
- Alligator clips for 12-volt auxiliary power.
- Gel-cell auto-charges when auxiliary power connected.
- "Zero" to "Null" gradient.
- Permanent gel-cell battery-mounted under electronics panel.
- Bull-nosed and tapered sensor on BHG; longer sensor on MUL for diver or boat towing.
- 1 year warranty

Magnetic Underwater Sensor

- Durable detector finds metal immersed in 1,000+ feet of water
- Longer sensor, for diver or boat towing.

SPECIFICATIONS

CONTROLS
- On, Off
- Volume Up and Down
- Range setting (Gain or Sensitivity) Up and Down
- Zero, Plus and Minus
- Auto Zero - Automatic self-adjusting

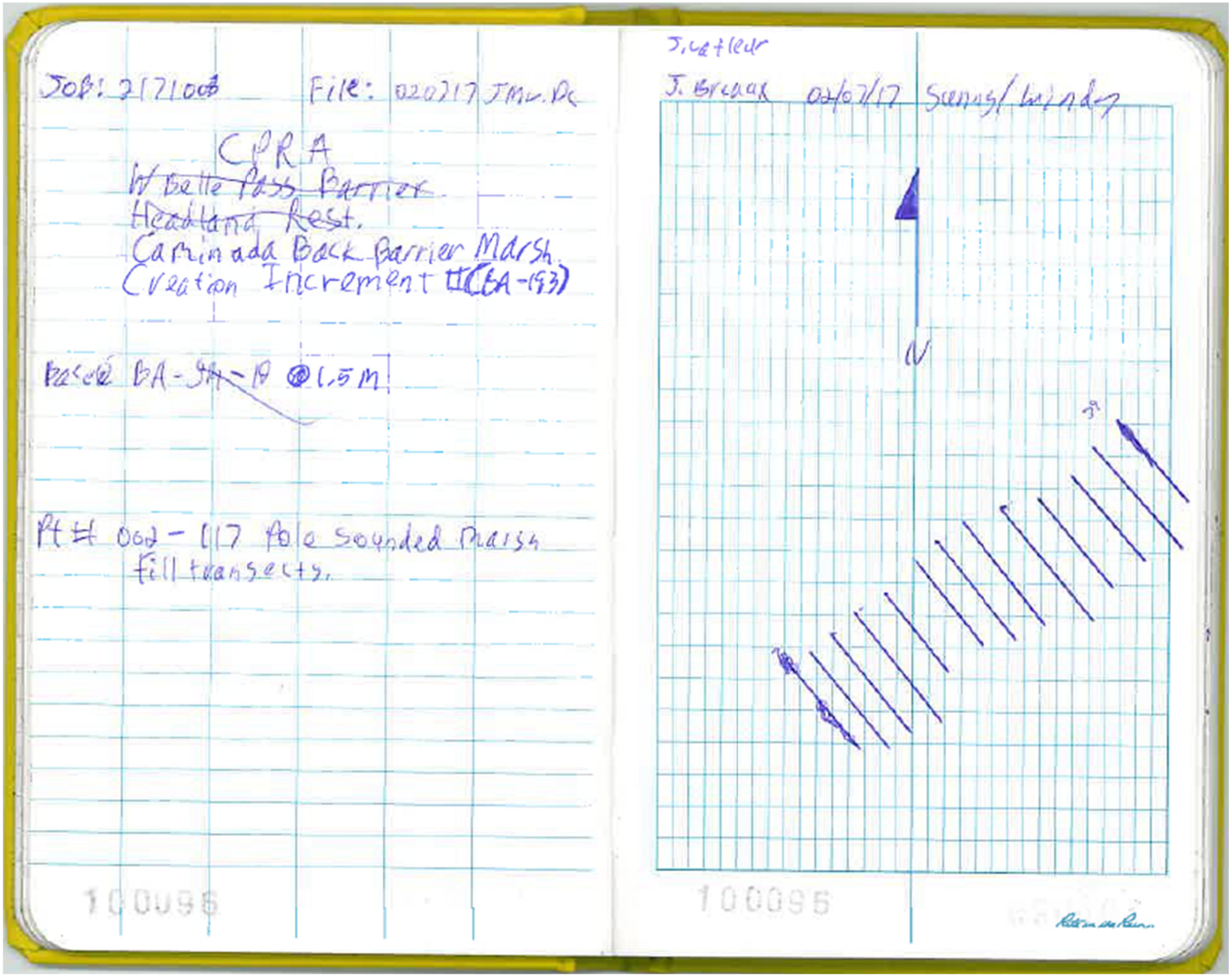
OUTPUTS
- Audio Frequency Pitch (speaker and jack for headset)
- Visual LCD Display
- Bar Graph - range Gain setting - milligauss
- RS-232 PC connection (cable included)
- Control all keypad functions data log range, keypad and signal settings works with hyper terminal or equivalent

POWER OPTIONS
- Internal Battery: 12-volt, 7.2Ah sealed lead acid
- Battery Life: 72 hours continuous use, charges to full overnight
- External Power: 12 to 15-volt, cable included
- Internal battery charging circuit is enabled when external power or AC charging cable is connected

DIMENSIONS
- Electronics: 16.9"w x 10"h x 6.5"d
- Sensor: 1.625"d x 34.375"L (4.13cm x 87.3cm)

Includes:
- ABS custom case
- Connectivity cables

APPENDIX C FIELD NOTES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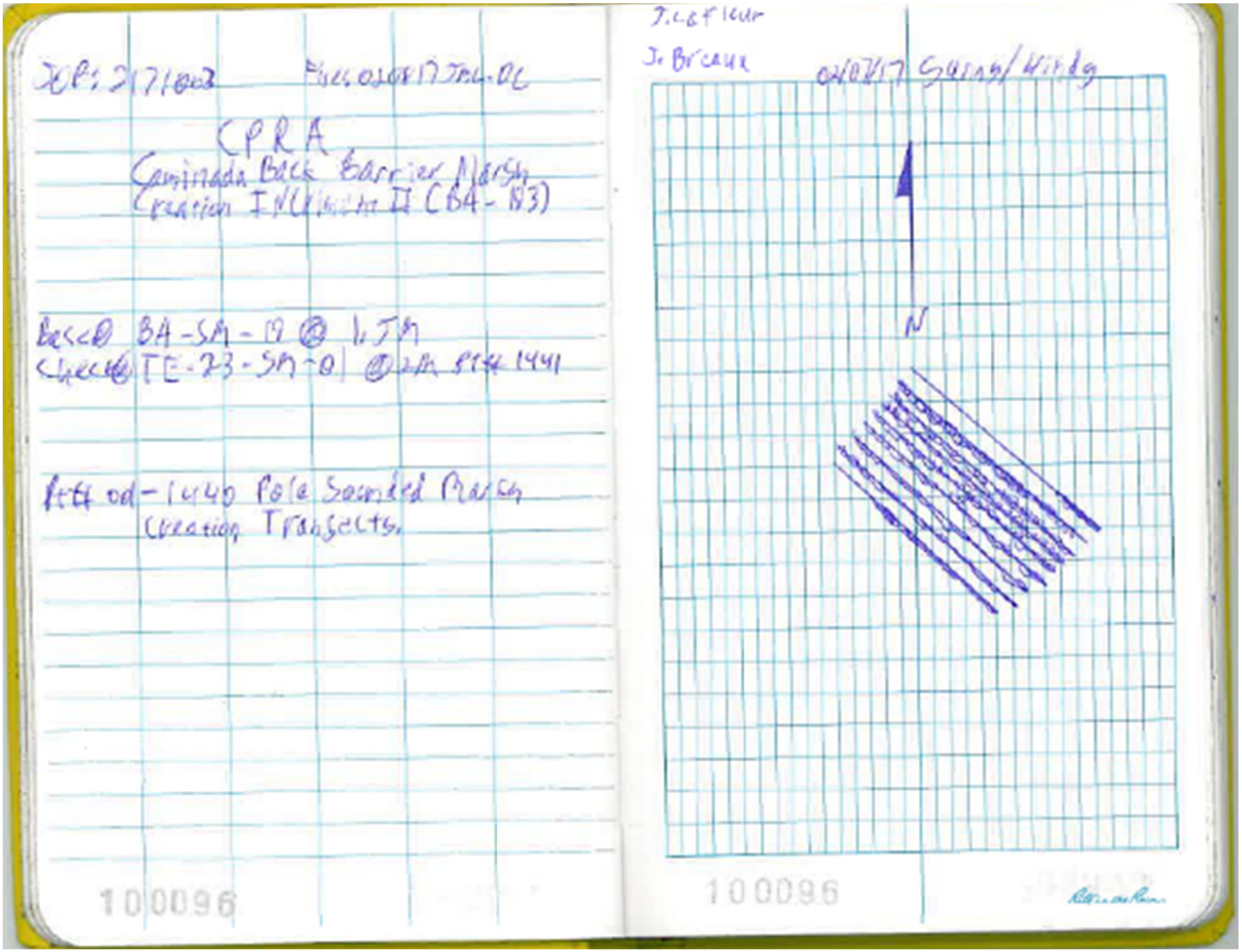
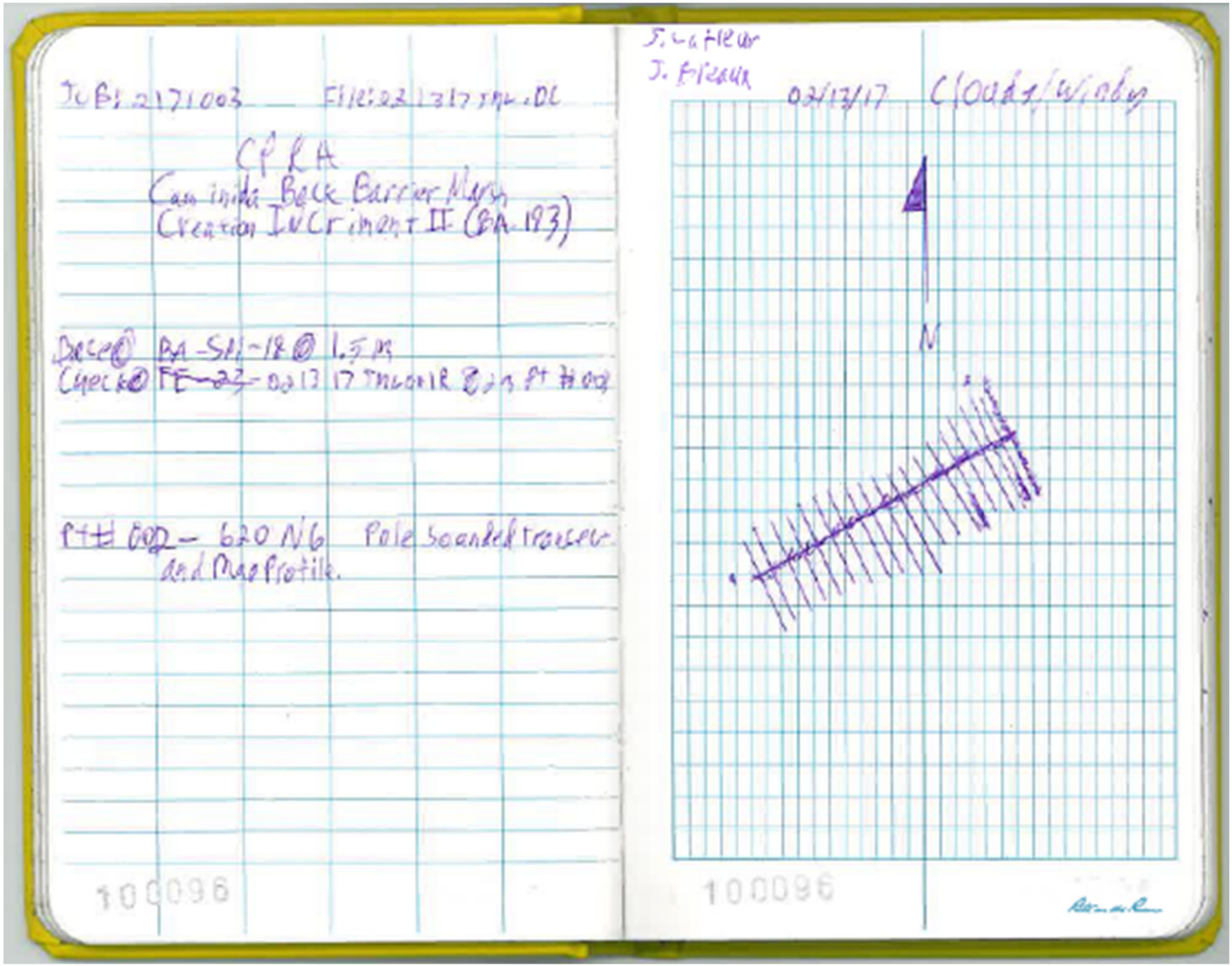
CPRA
W Belle Pass Barrier
Headland Rest.
Caminada Back Barrier Marsh
Creation Increment II (BA-193)
Base BA-34-A @1.5m
Pt # 002 - 017 Pole Sounded Marsh
fill transects.
100095
J. Cretler
J. Breaux 02/07/17 Sunny/ Windy
N
100095


CPRA
Caminada Back Barrier Marsh
Creation
N
100096
100096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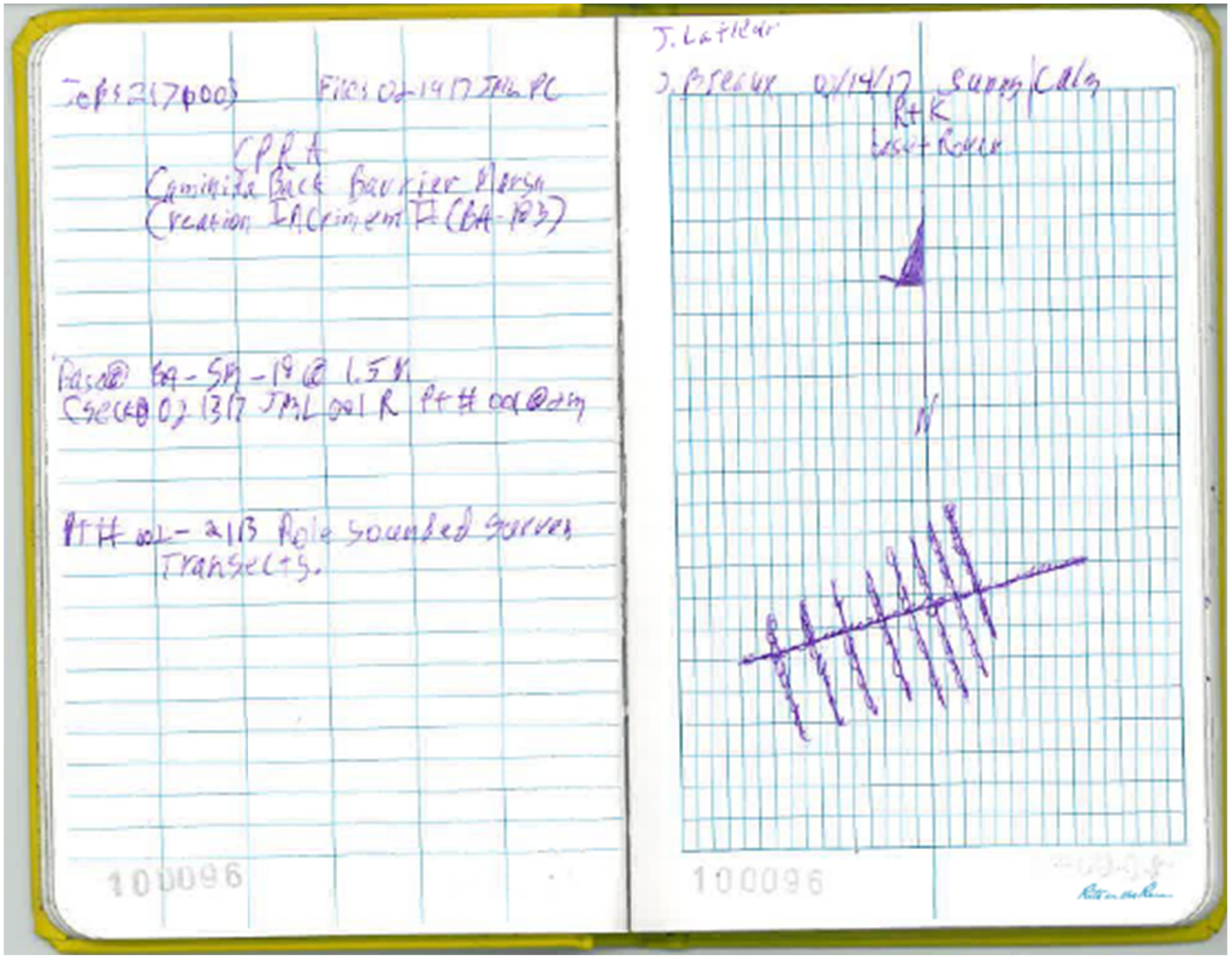
CPRA
Caminada Back Barrier Marsh
Creation Increment II (BA-193)
100096
S. Gaither
J. Breaux
02/13/17
Cloudy/windy
N
100096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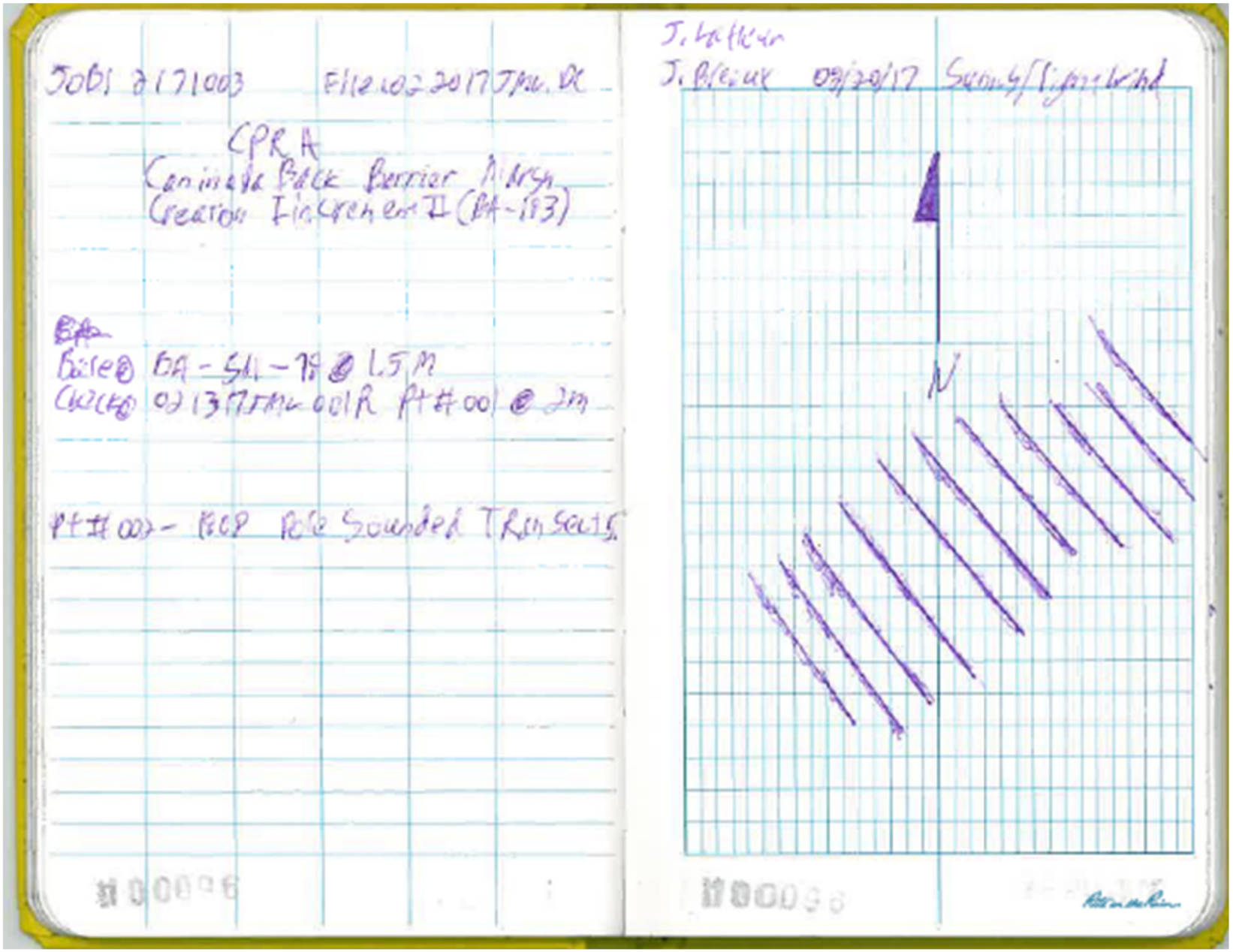
Creation Increment II (BA-193)
Base@ bq - SM - 19 @ 1.5 M
Sec(s)@ 02, 13, 17 JML pol R Pt # col @ dig
Pt # col - 213 Pole sounded Survey
Transects.
100096
J. Latiker
J. Breaux 02/14/17 Survey Calc
R+K
Lake + Rover
N
100096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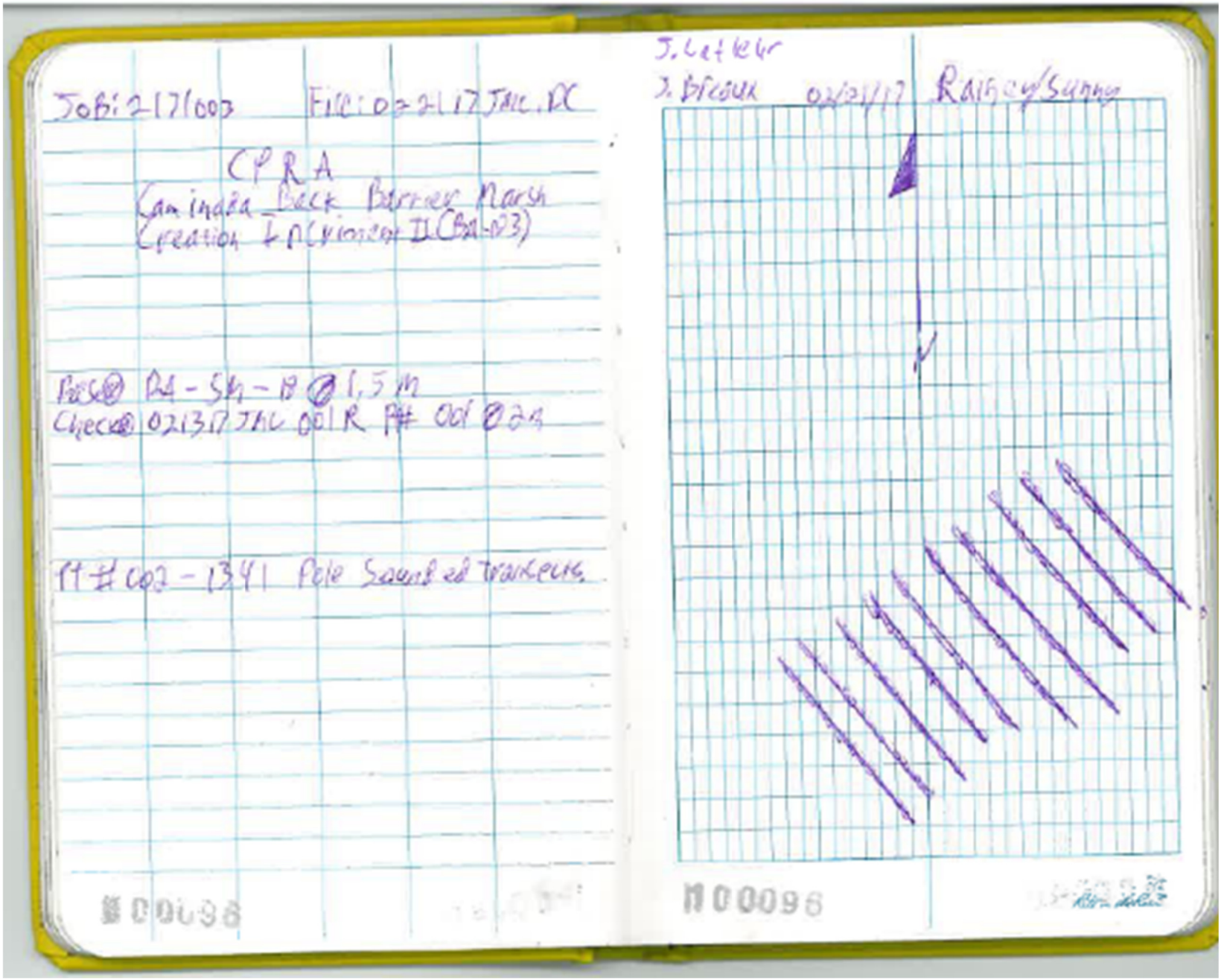
Caminada Back Barrier Marsh
Creation Increment II (BA-193)
Base @ BA-SU-7 @ 1.5 M
Check @ 02137JM001R Pt#001 @ 2m
Pt#002 - RCP Rob Sounded Transects
J. Lafleur
J. Breaux 09/20/17 Sounding/Signature
N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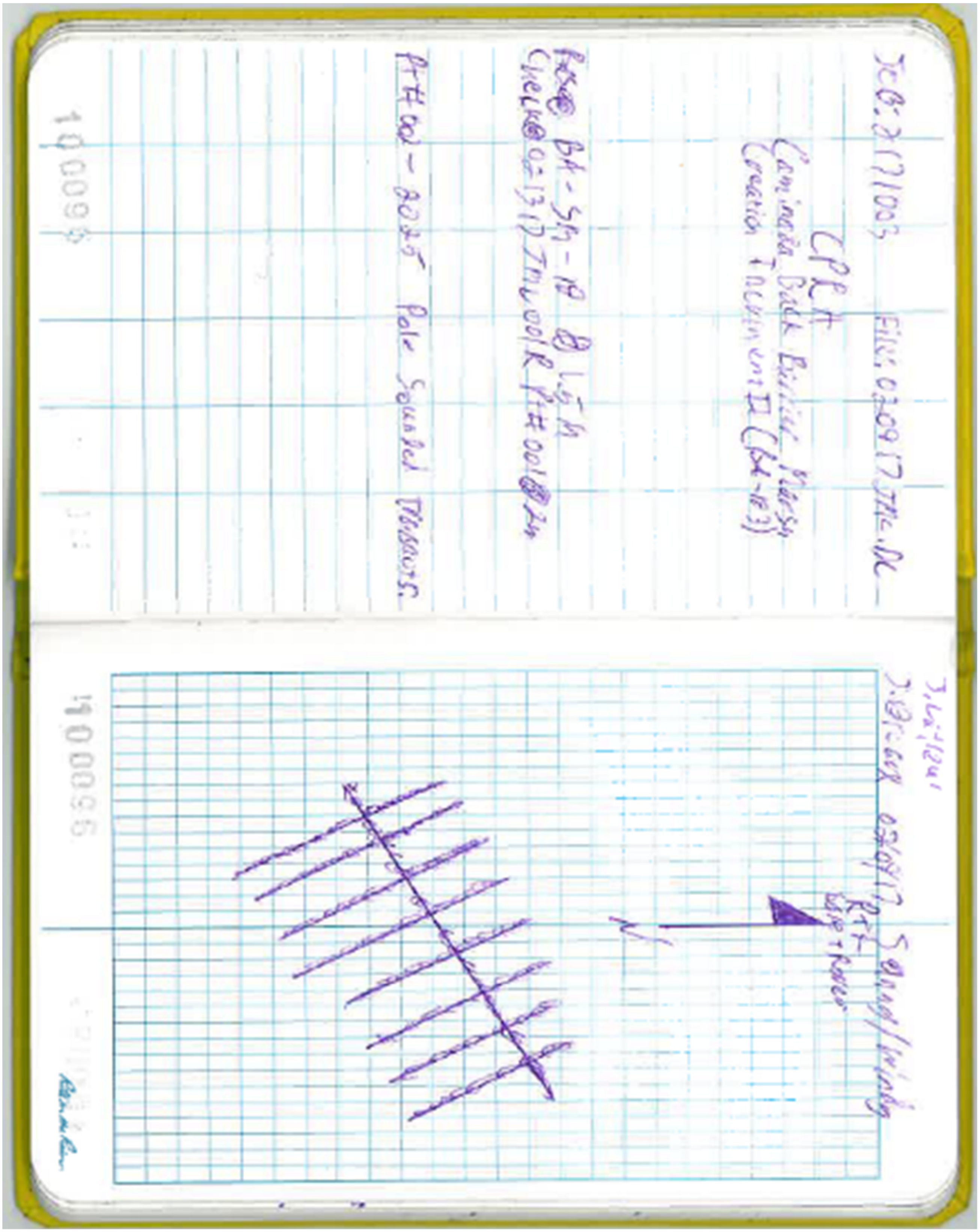
Creation Increment II (BA-193)
Pass 04 - SH - 18 @ 1.5 m
Check 021317 JAL 001 R Pt# 001 @ 24
Pt # 002 - 1341 Pole Sounded Trackers
J. Letteer
J. Breaux 02/13/17 Rain & Sunny
N00098
N00098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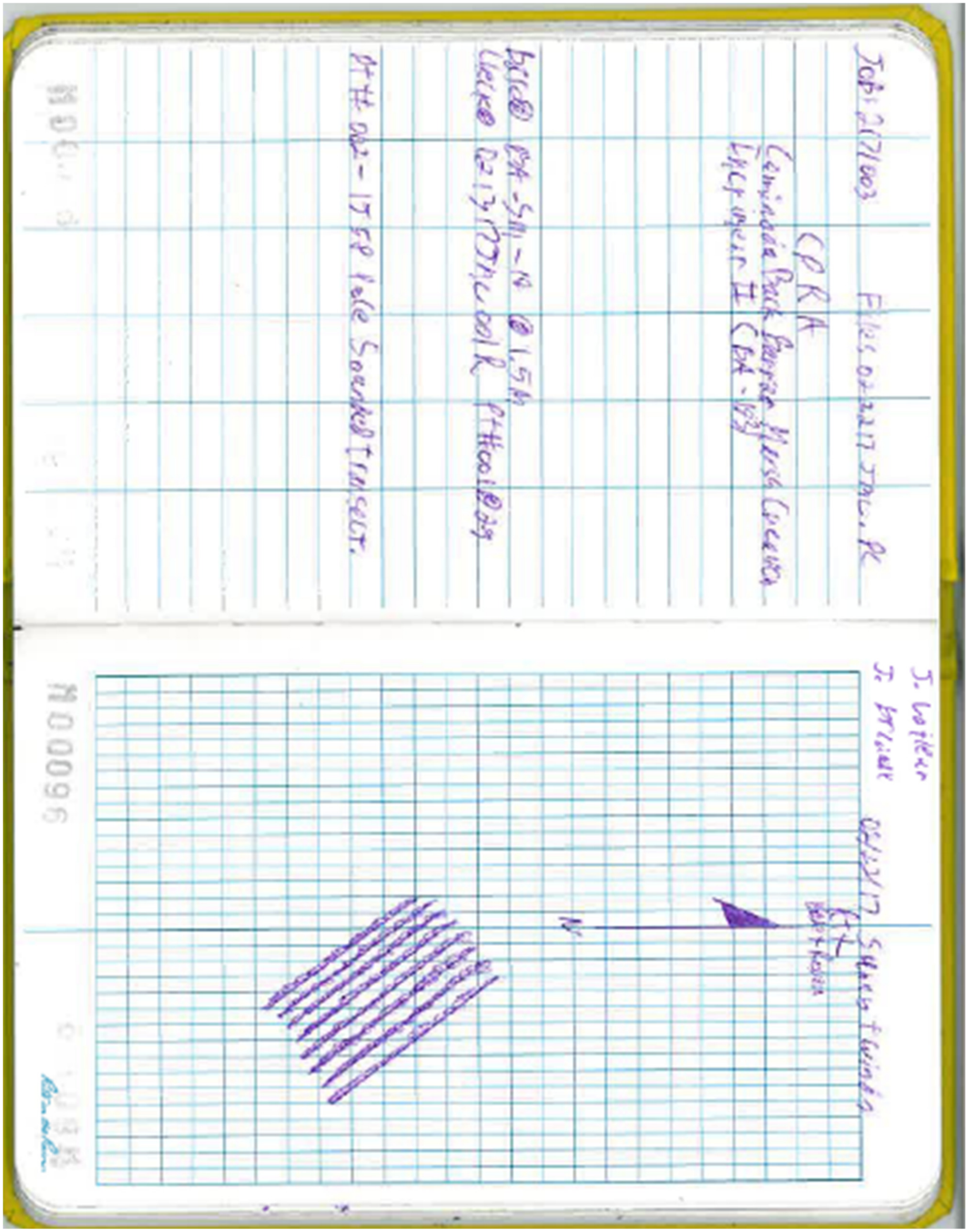
Creation Increment II (BA-193)
BA-54-19
Pole Sounded
RTK
N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N
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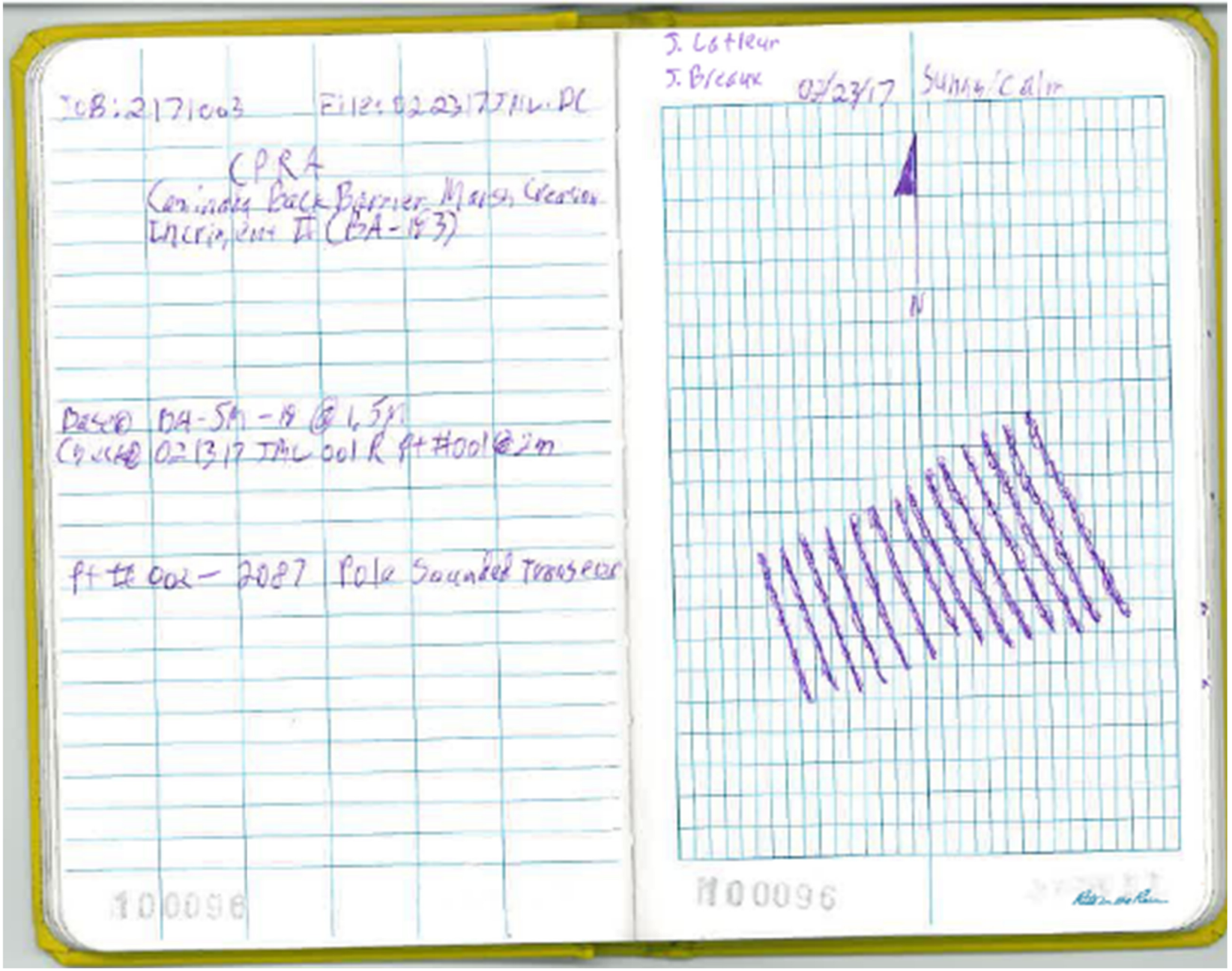
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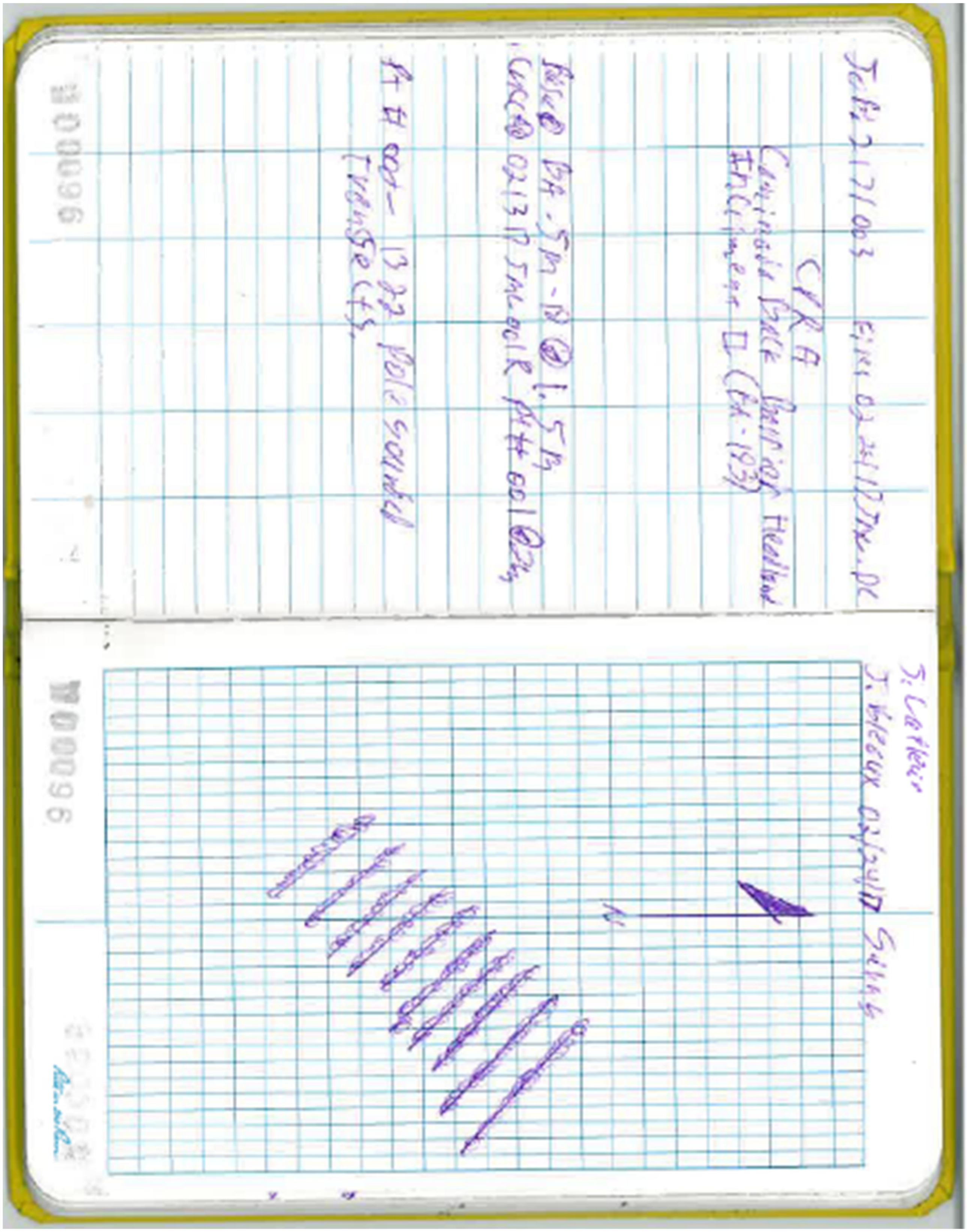
Increment II (BA-193)
Desc# BA-5M-19 @ 1.5m
Check 022317 JHL cal R ft Hook @ 2m
ft to 002 - 2087 Pole Sounded Transects
100096
J. Lotleur
J. Breaux
07/23/17
Sunny/Calm
N
100096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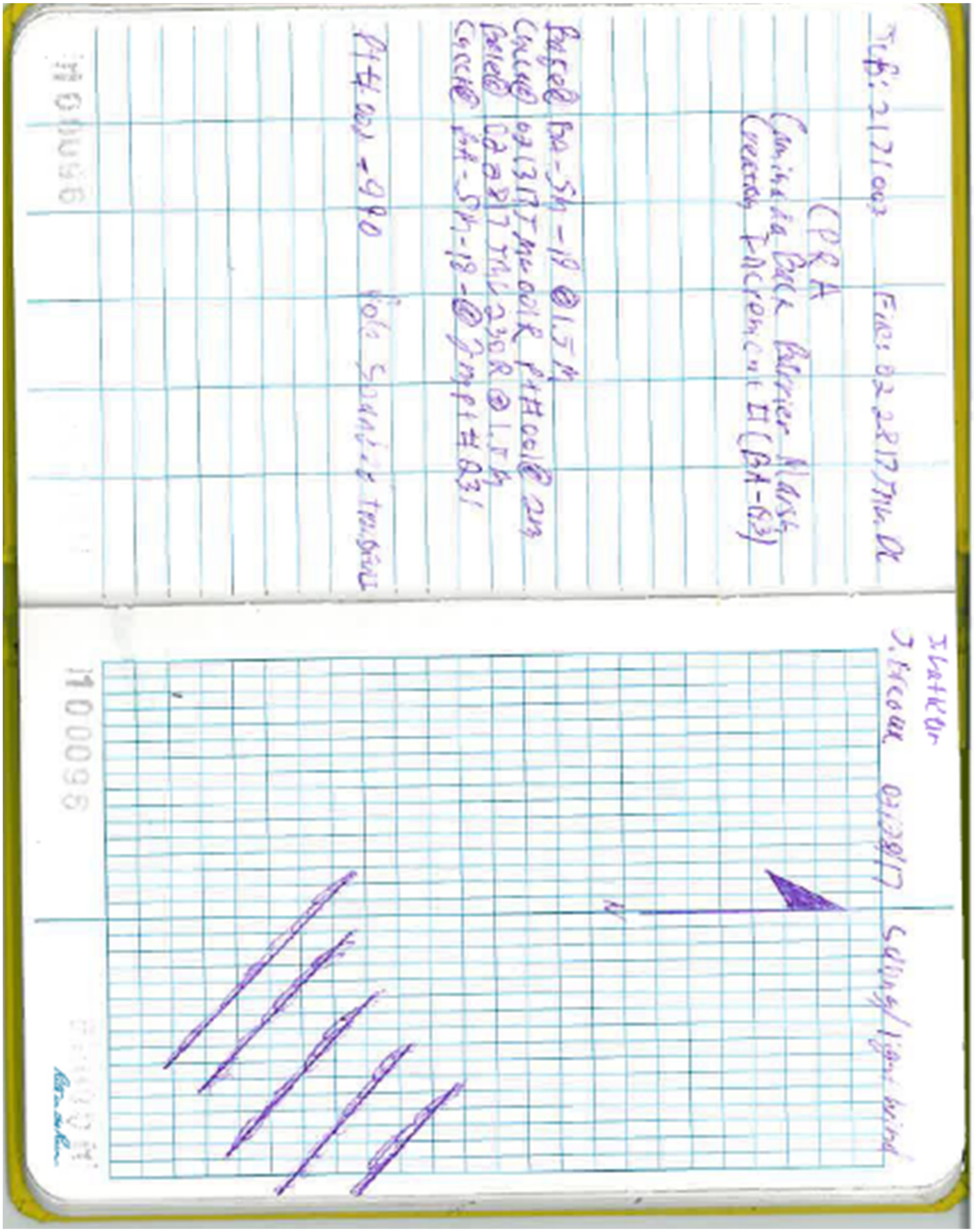
J. Carter
N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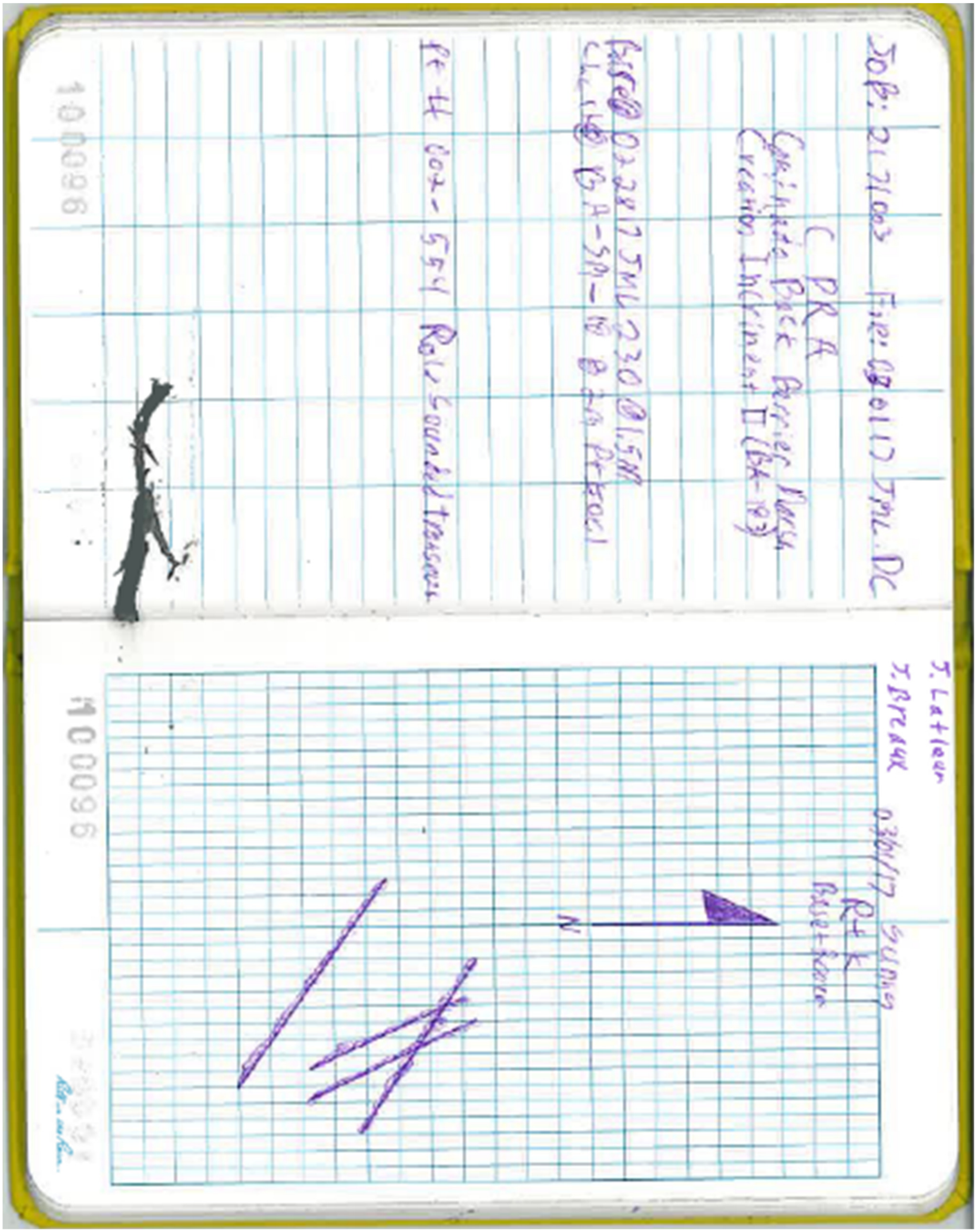
Creation Increment II (BA-193)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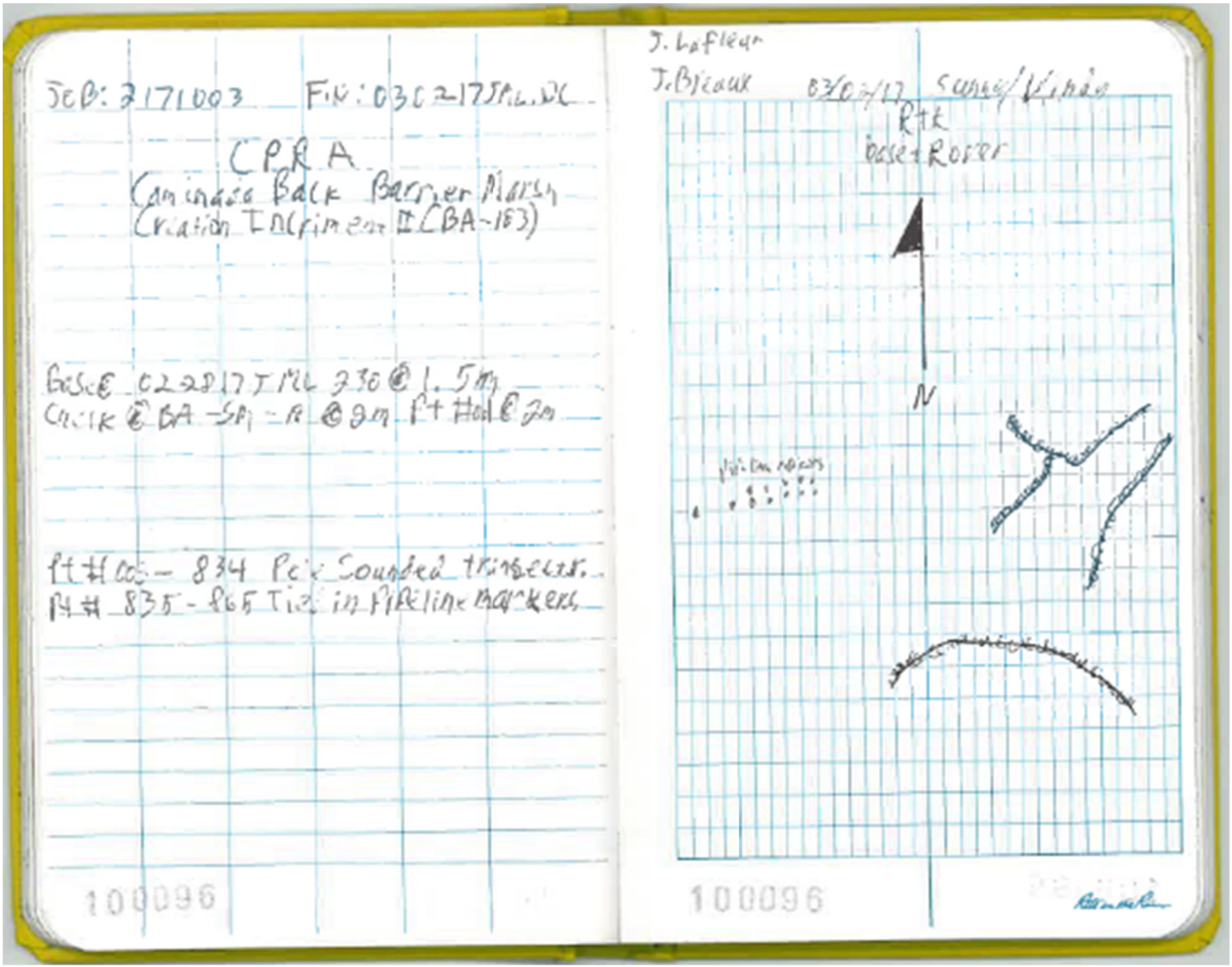
Caminada Back Barrier Marsh
Creation Increment II (BA-193)
J. Latleur
J. Breaux
03/01/17
R+K
Base+Rover
N
100096
100096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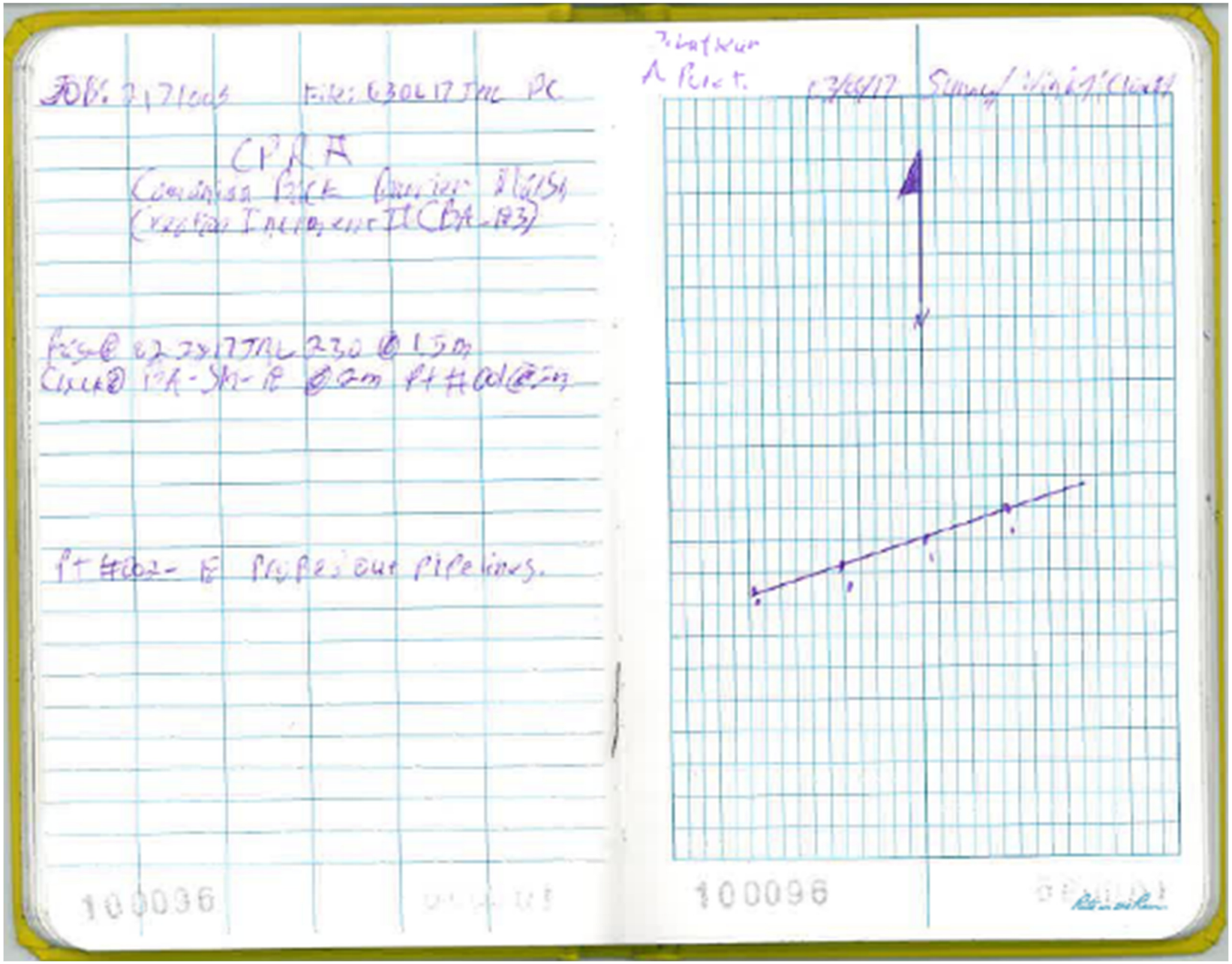
Caminada Back Barrier Marsh
Creation Increment II (BA-193)
Base @ 022817 JL 330 @ 1.5m
Chk @ BA-SP1-R @ 9m Pt Hdg @ 2m
Pt # 005 - 834 Pole Sounded transects.
Pt # 835 - 865 Tie in Pipeline markers
100096
J. Lafleur
J. Breaux 03/01/17 Survey/Kinds
RTK
Base + Rover
N
100096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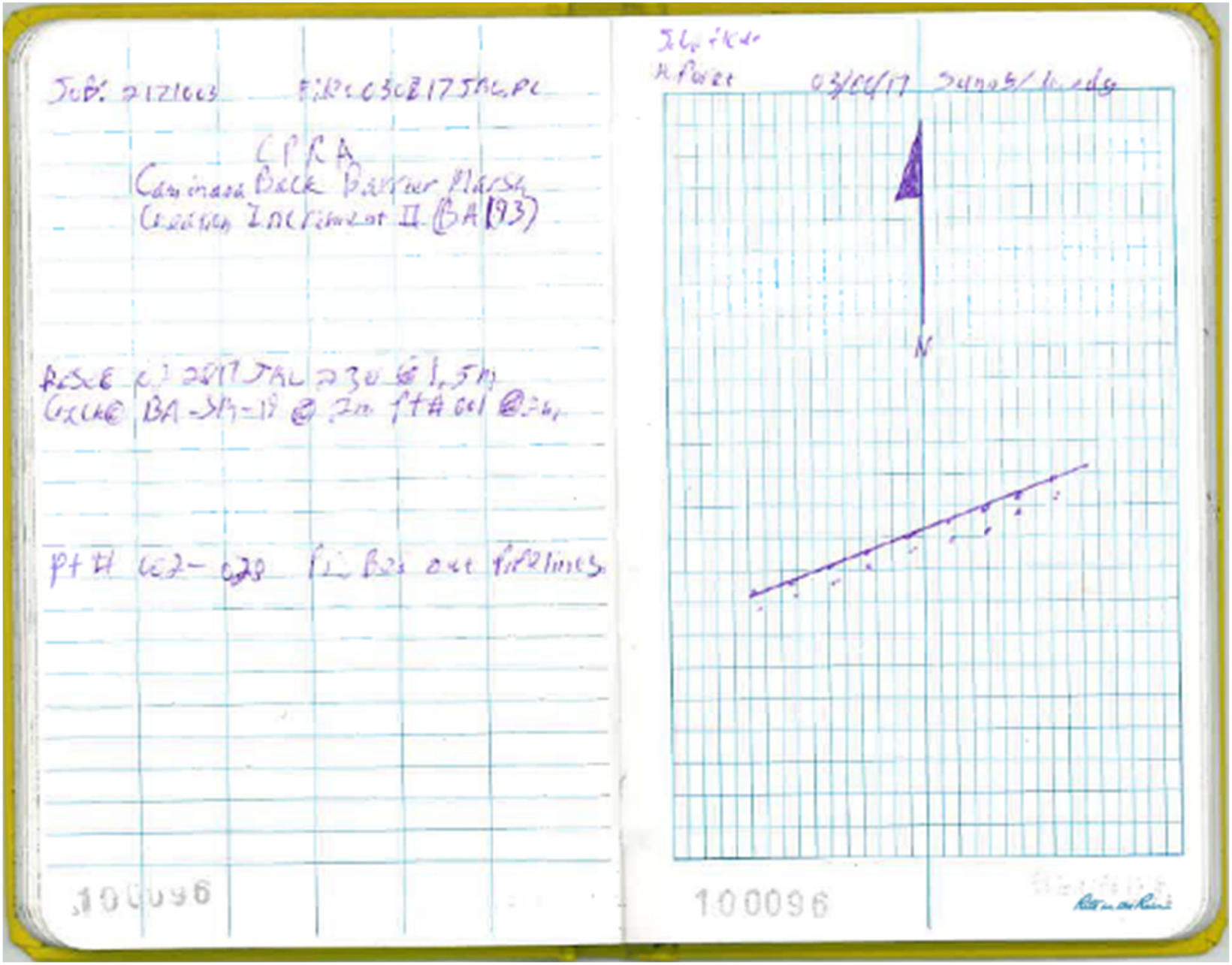
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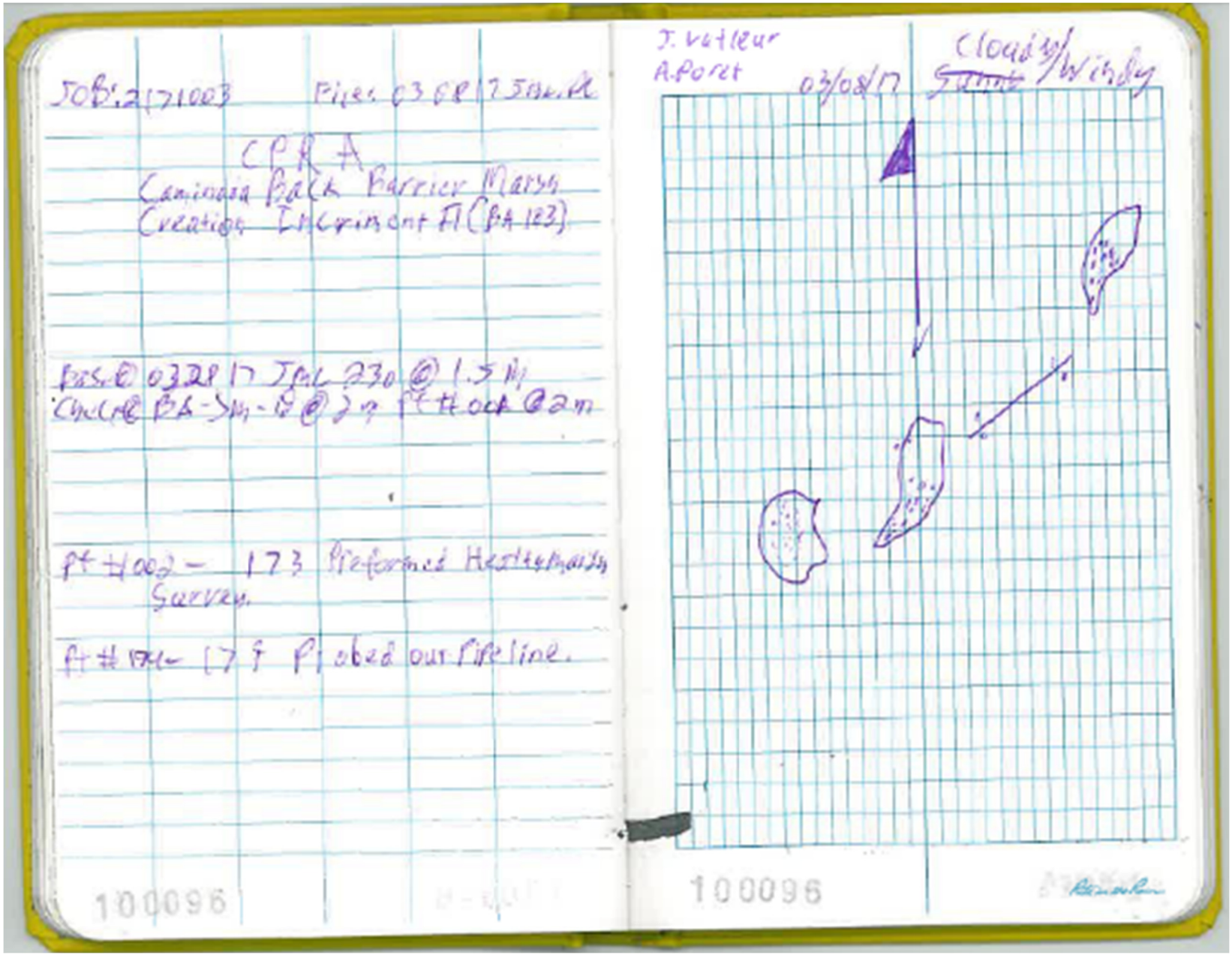
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J. Vetleur
A.Porret
03/08/17
Cloudy/Windy
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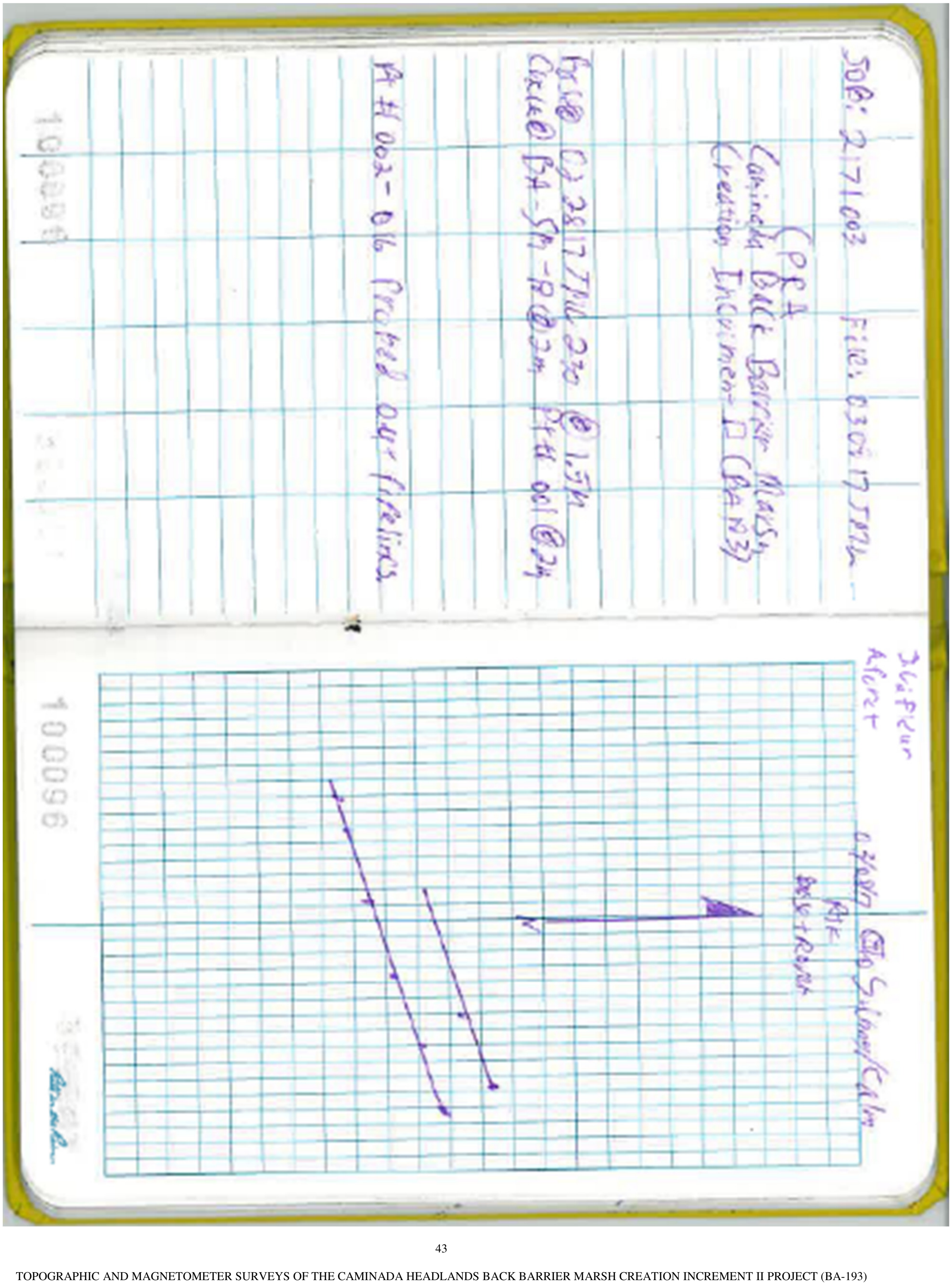
100096



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CPRA
Caminada Back Barrier Marsh
Creation Increment II (BA 193)

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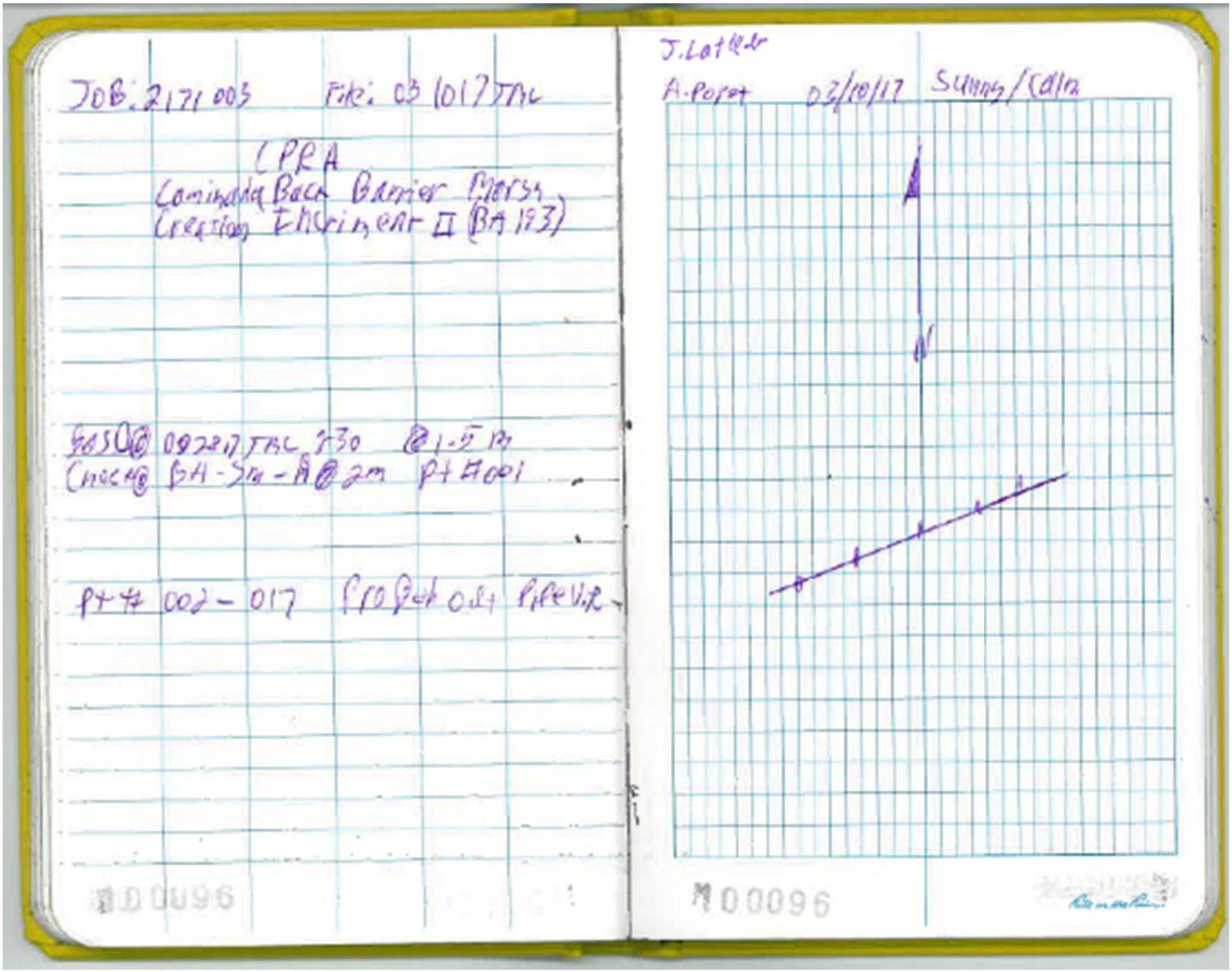
Circle @ BA-5M-R @ 2m Pt# 001 @ 2m

Pt# 002- 016 Probed out pipelines.

100096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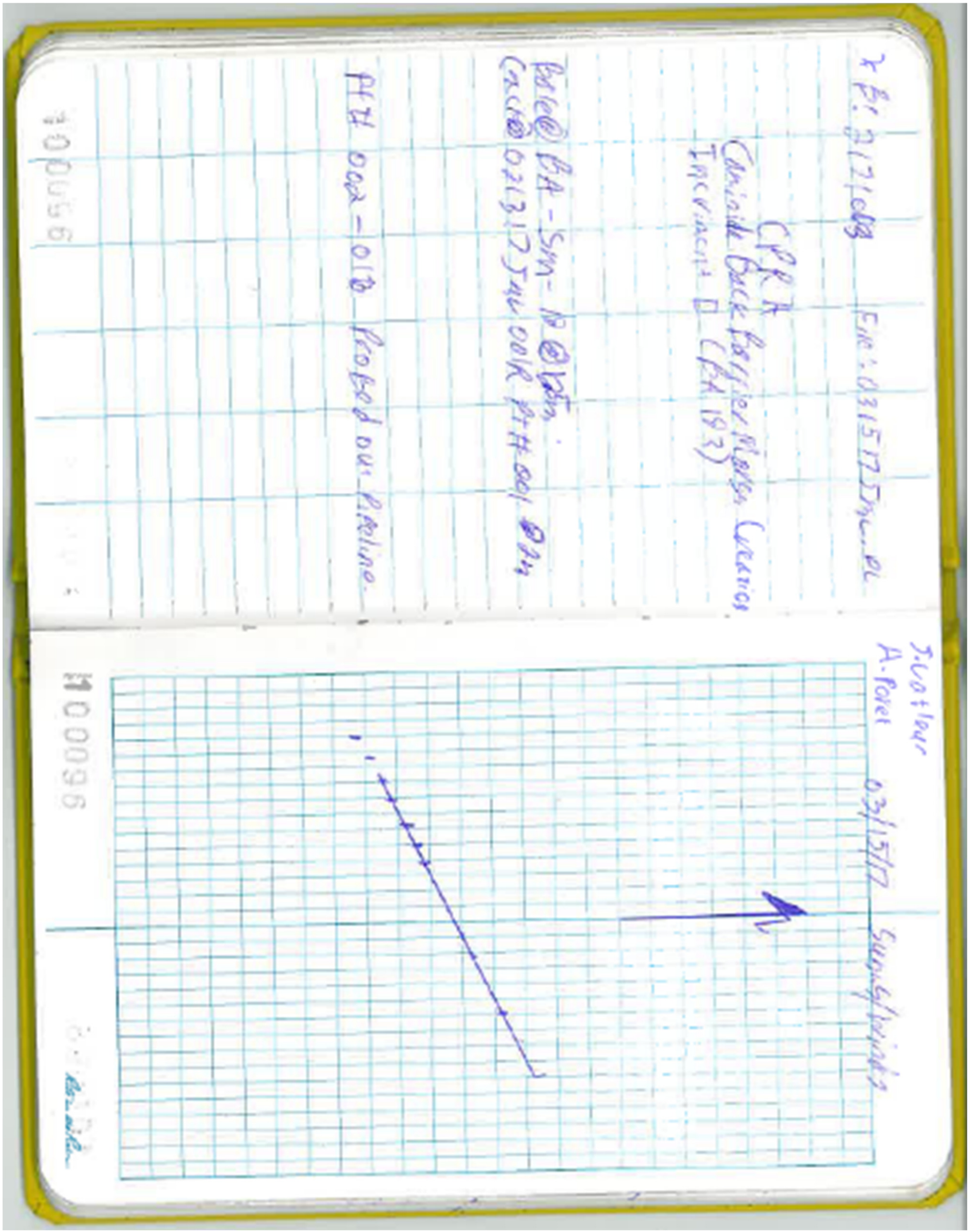
Caminada Back Barrier Marsh
Creation Enhancement II (BA 193)
J. Lotter
A. Porat 02/10/17 Sunny/Cold
00096
00096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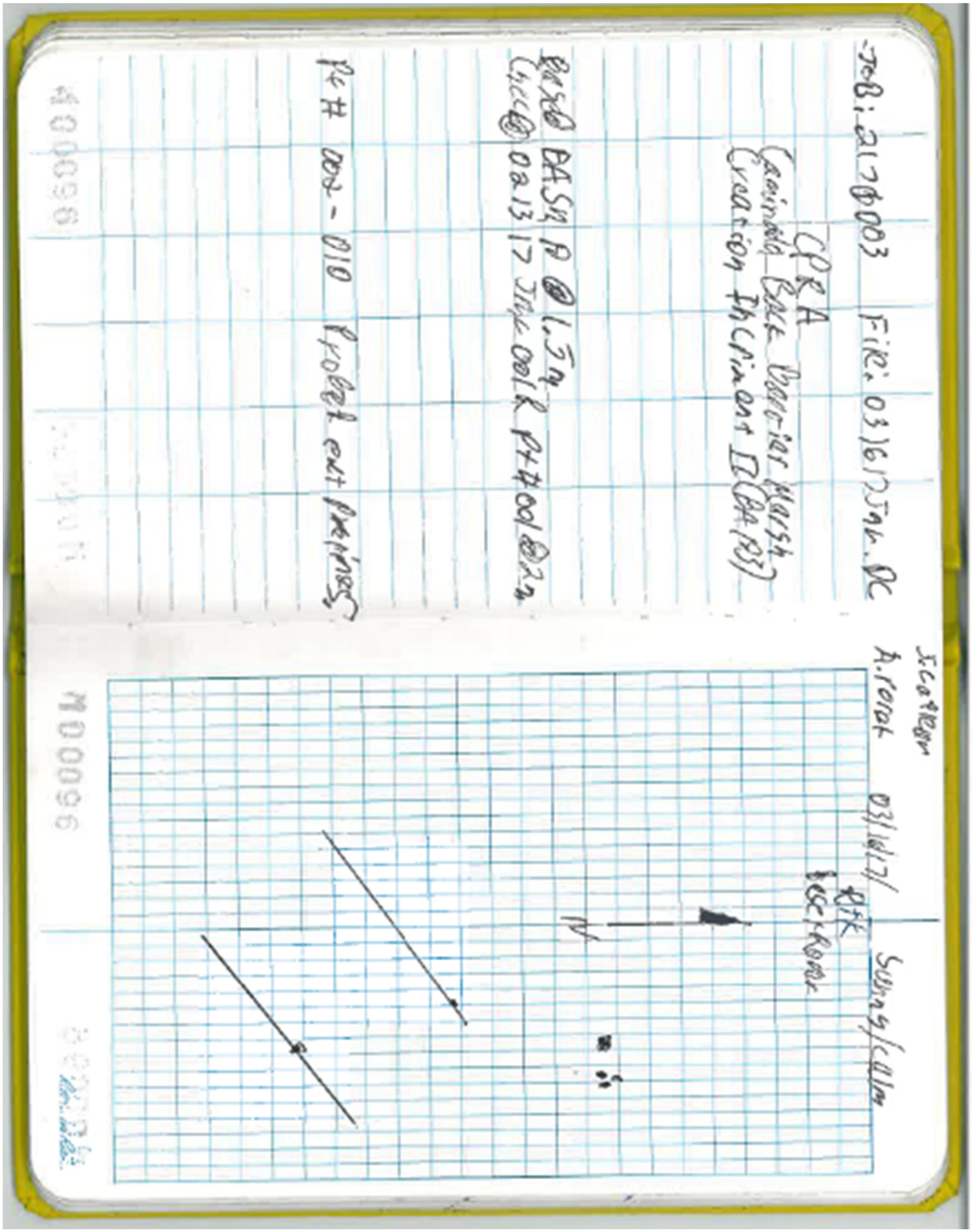
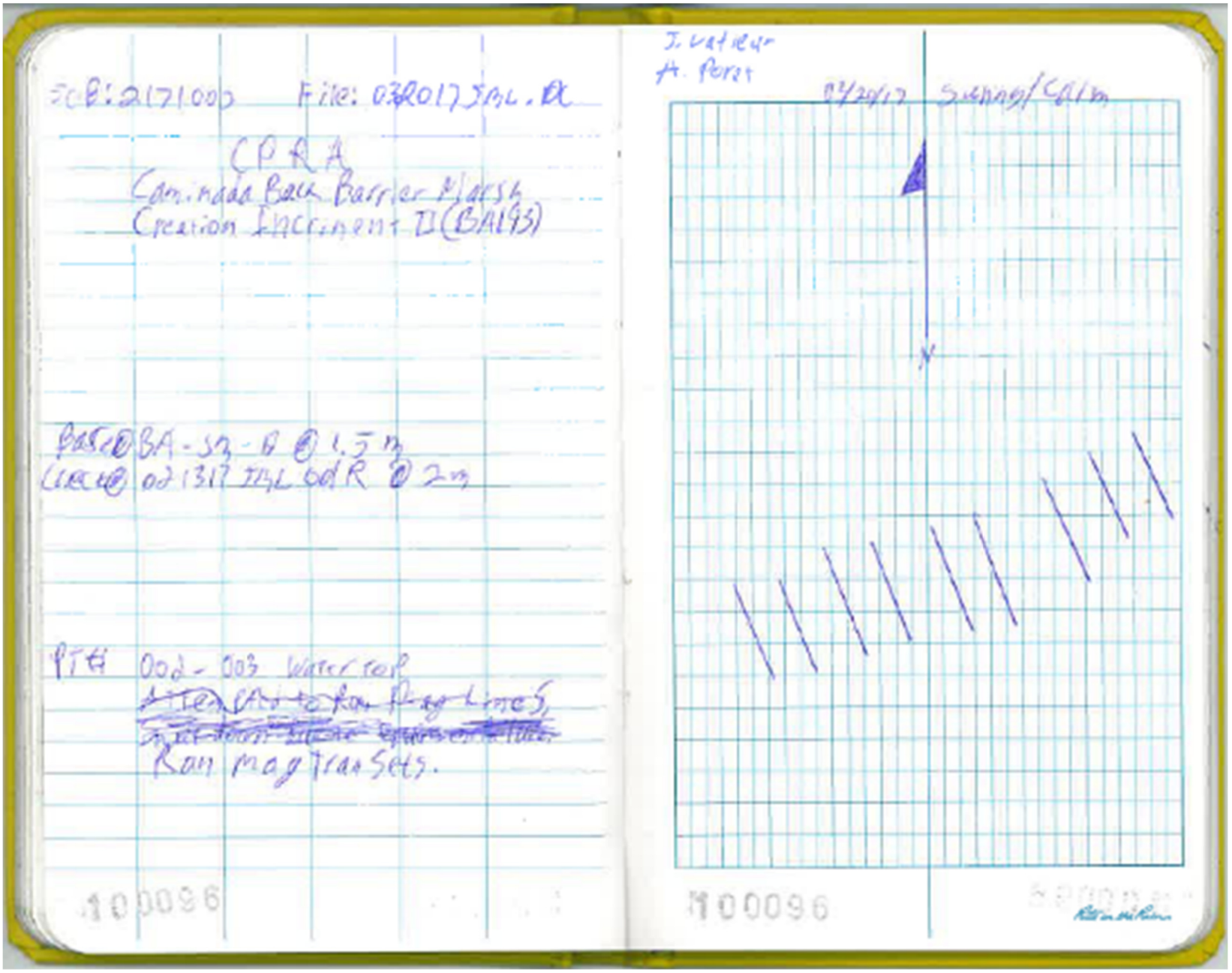
A. Poret
03/15/17
100056
100096

*

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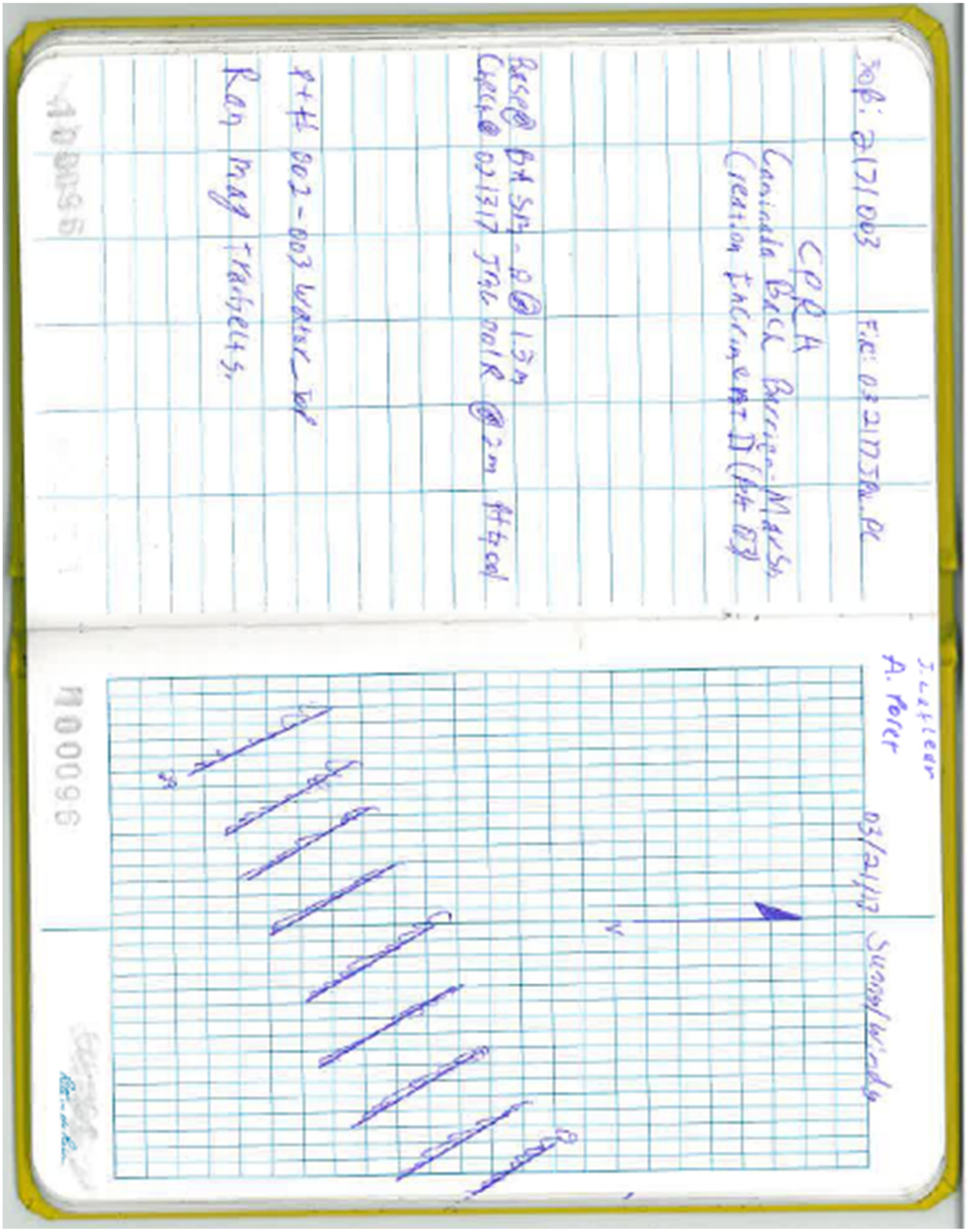
Caminada Back Barrier Marsh
Creation Increment II (BA193)
BASE BA-SZ-B @ 1.5 m
CHECK 03 1317 JAL 66R @ 2m
PTH 002 - 003 Water rep
Ran mag transects.
100096
J. Latiker
A. Perez
03/20/13 Sunny/Calm
N
100096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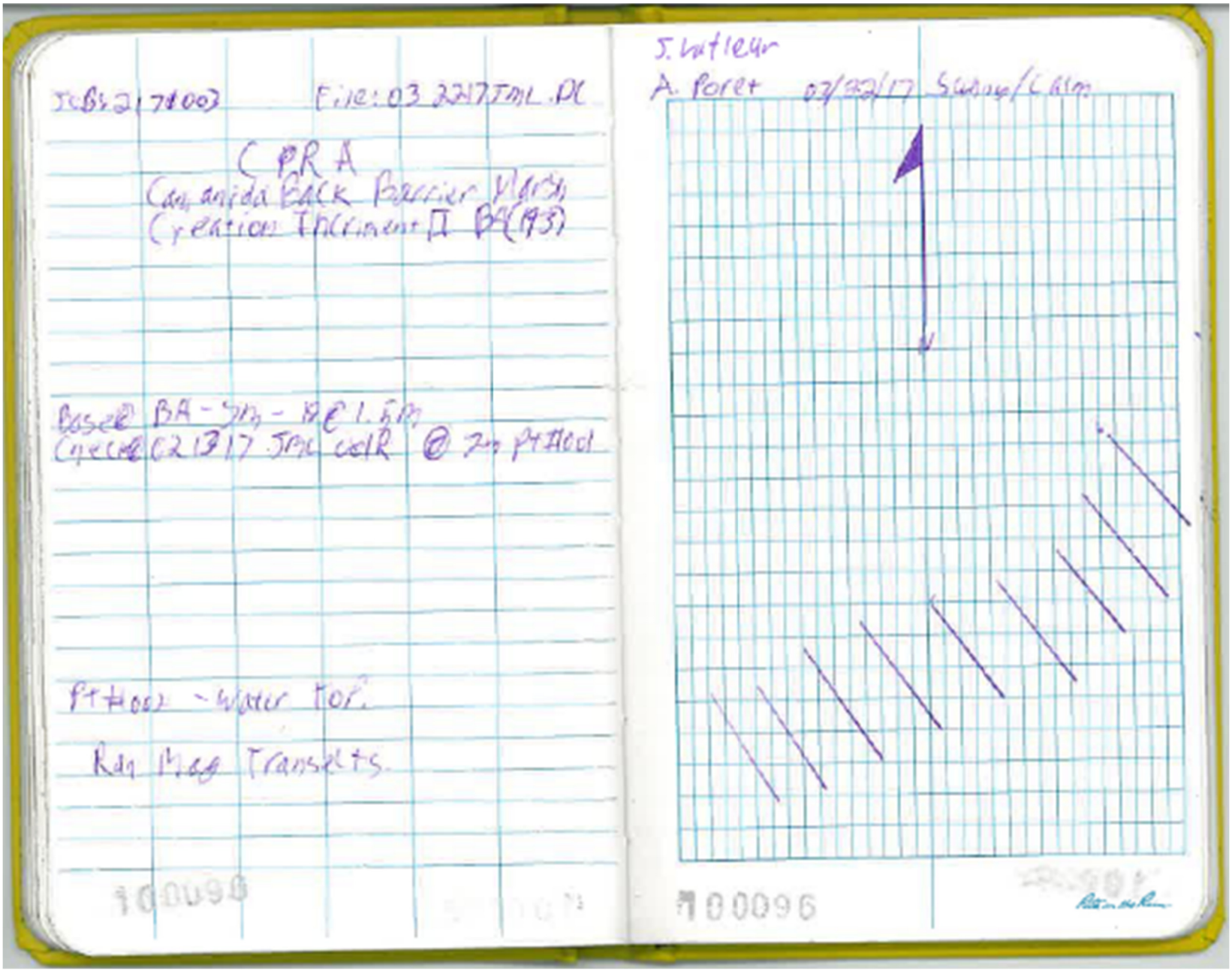
Ran mag transects.
A. Perez
Sunny/windy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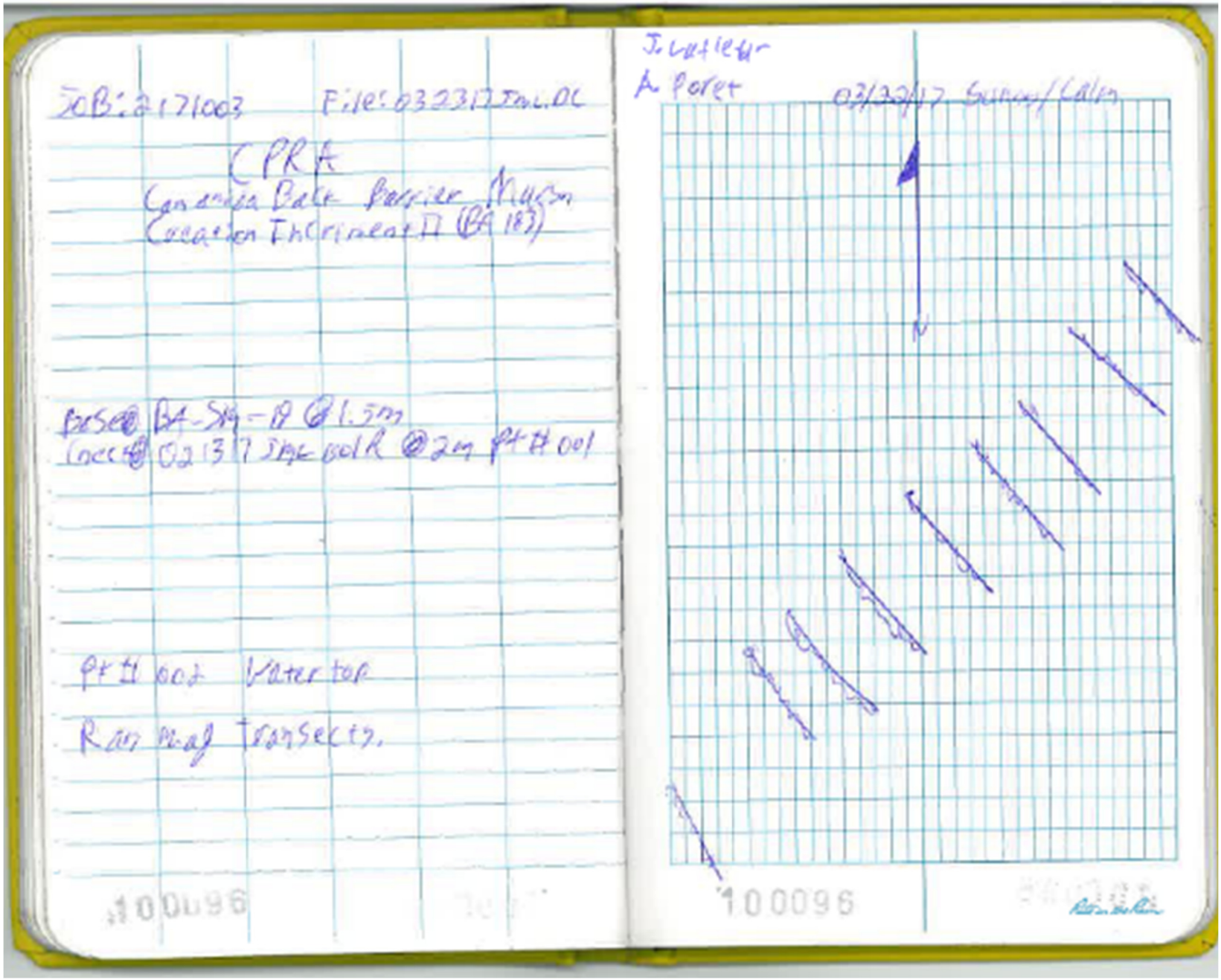
Caminada Back Barrier Marsh
Creation Increment II BA(193)
Based BA-304 - RTK 1.5m
Checked 02/17 JML calR @ 2m ptHood
ptHood - Water Tor.
Rdy Mag Transects.
100096
J. Lutteur
A. Poret 02/22/17 Swamp/Cabin
100096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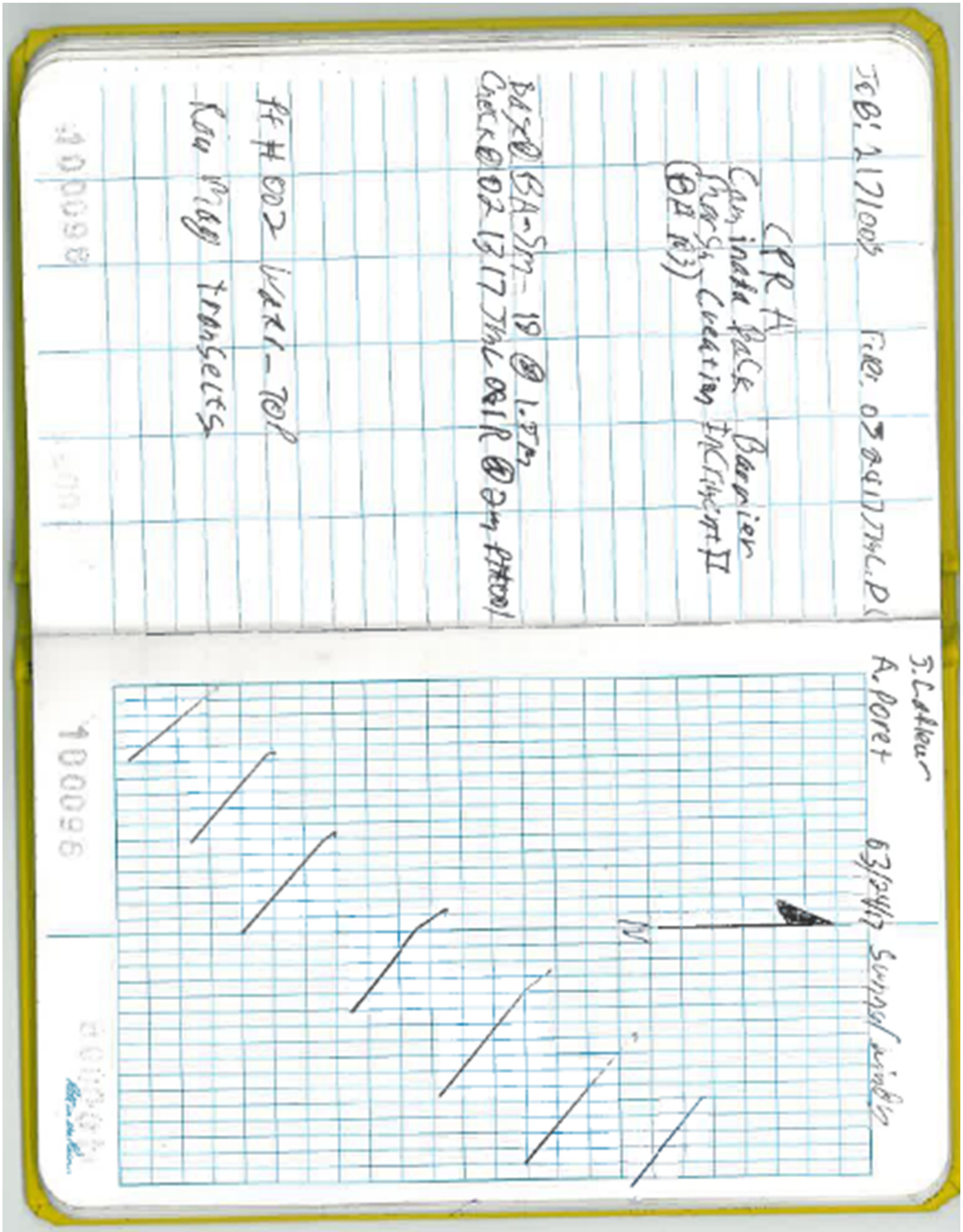
CPRA
Caminada Bale Barrier Marsh
Creation Thelma II (BA 183)
Base @ BA-SM-B @ 1.5m
Loc @ 02 13 17 JmL GPS R @ 2m Pt # 001
Pt # 002 Water top
Raw Mag Transects.
100096
J. Lutteur
A. Poret
02/23/17 Survey/Calm
N
100096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CPRA
Caminada Back Barrier
Marsh Creation Increment II
(BA 193)
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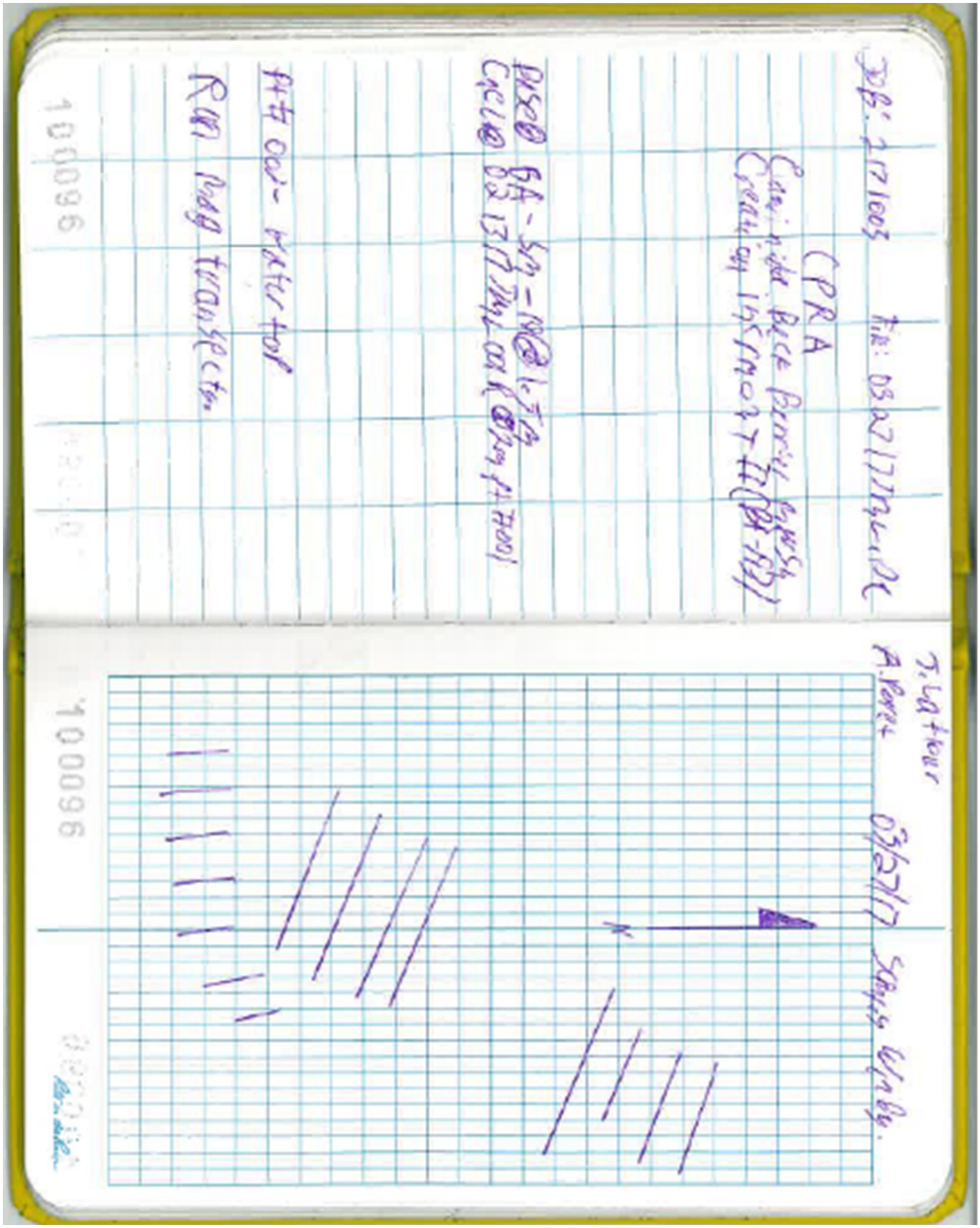
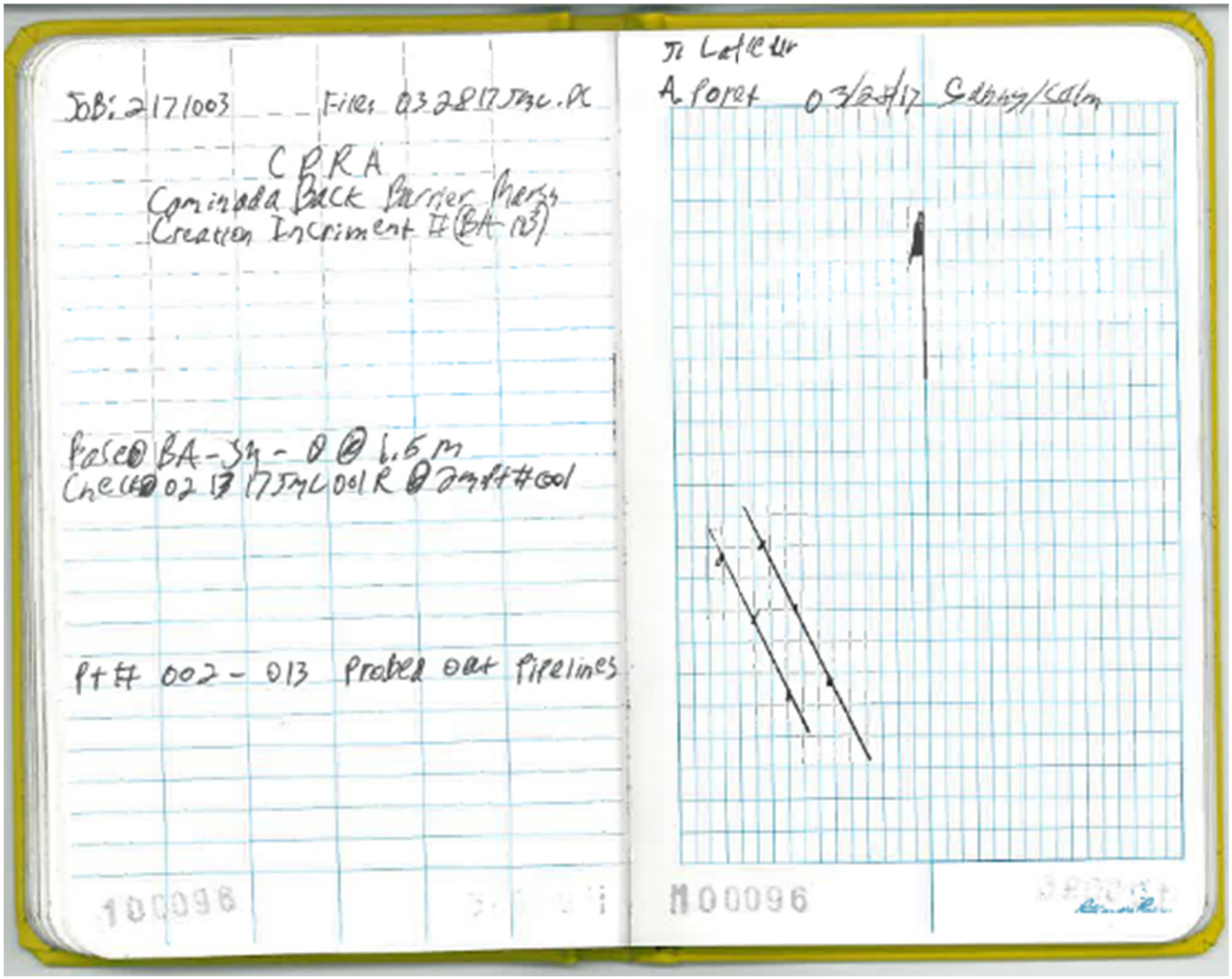
Check @ 02 1317 JHL 0818 @ 0.4m
FF # 002 Walk-Top
Run Mag transects
J. Cotheau
A. Poret
03/24/17 Sunny/windy


CPRA
J. Latour
A. Perez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Check@02 13 17JMC001R@2m##001
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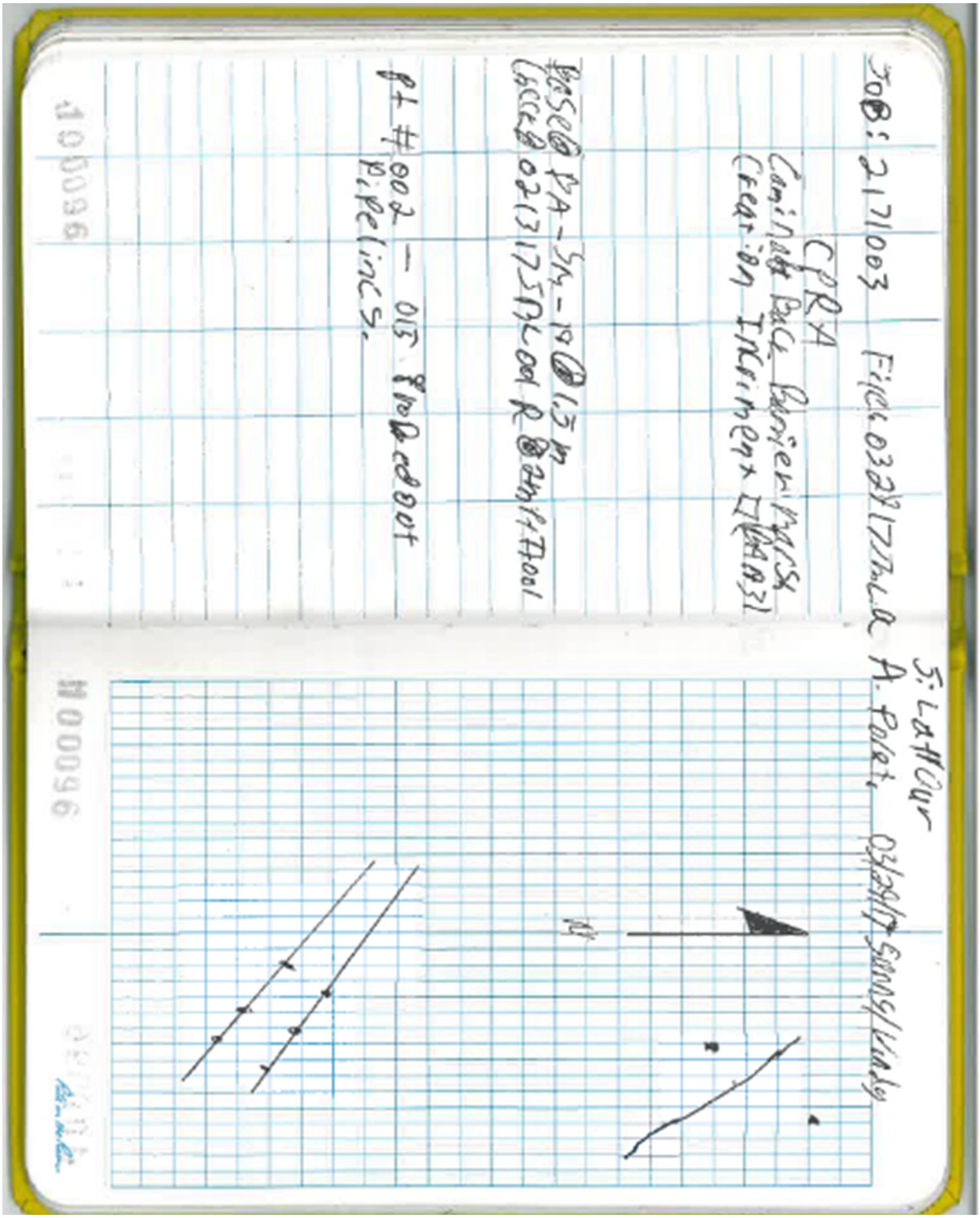
JL Latiker
A. Poret 03/28/17 Sunny/Calm
100096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CPRA
Pipelines.
100096
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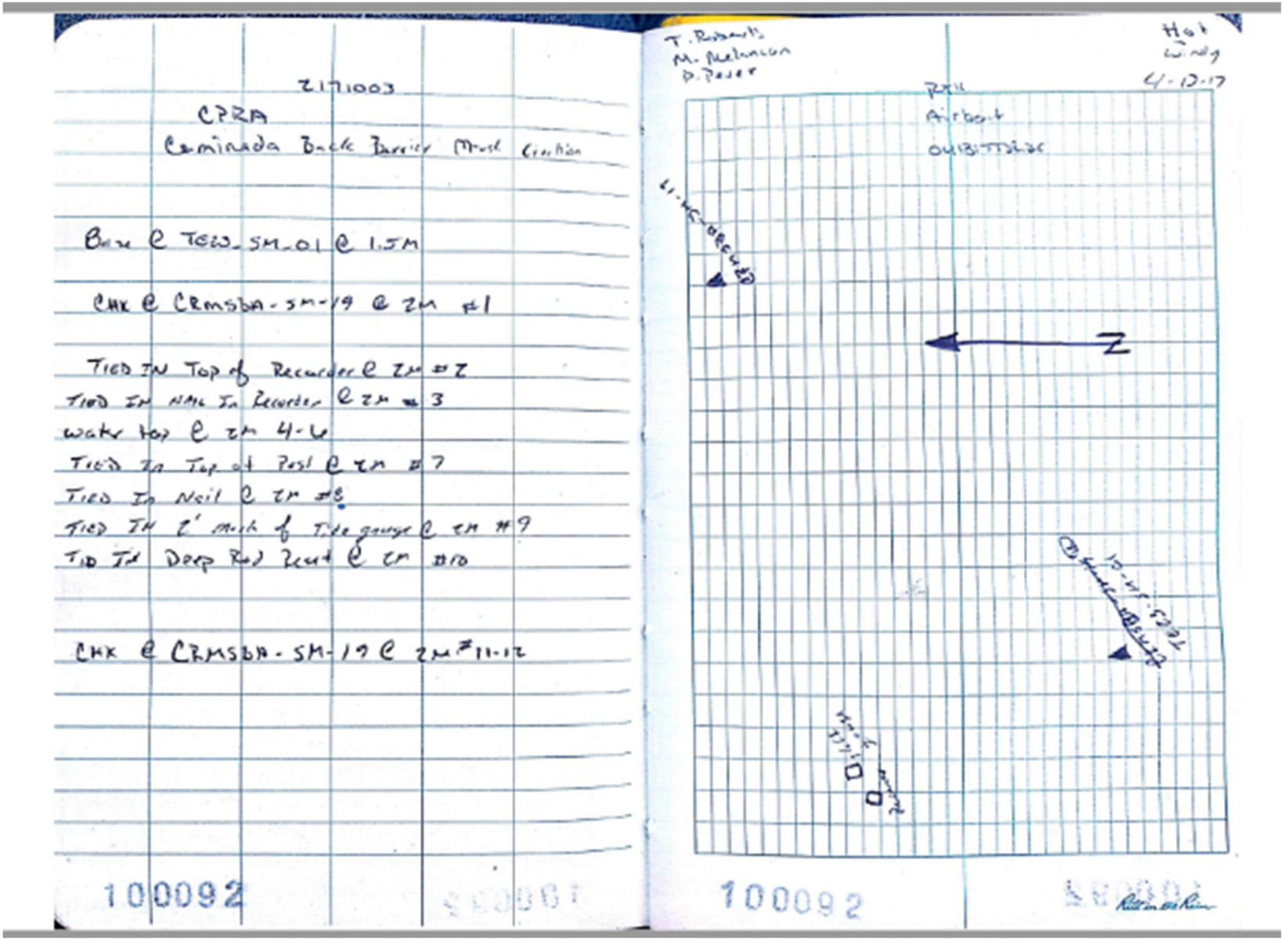
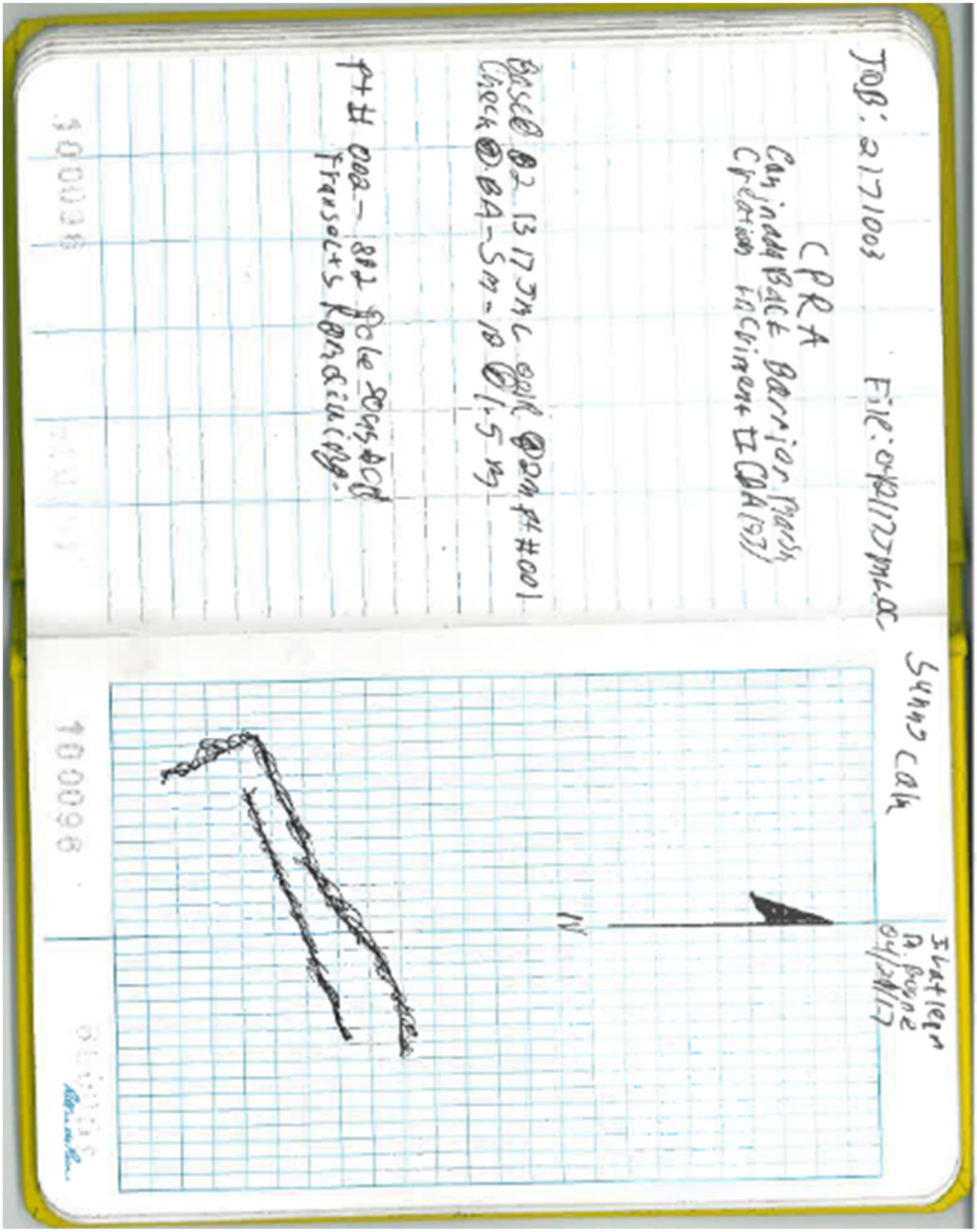
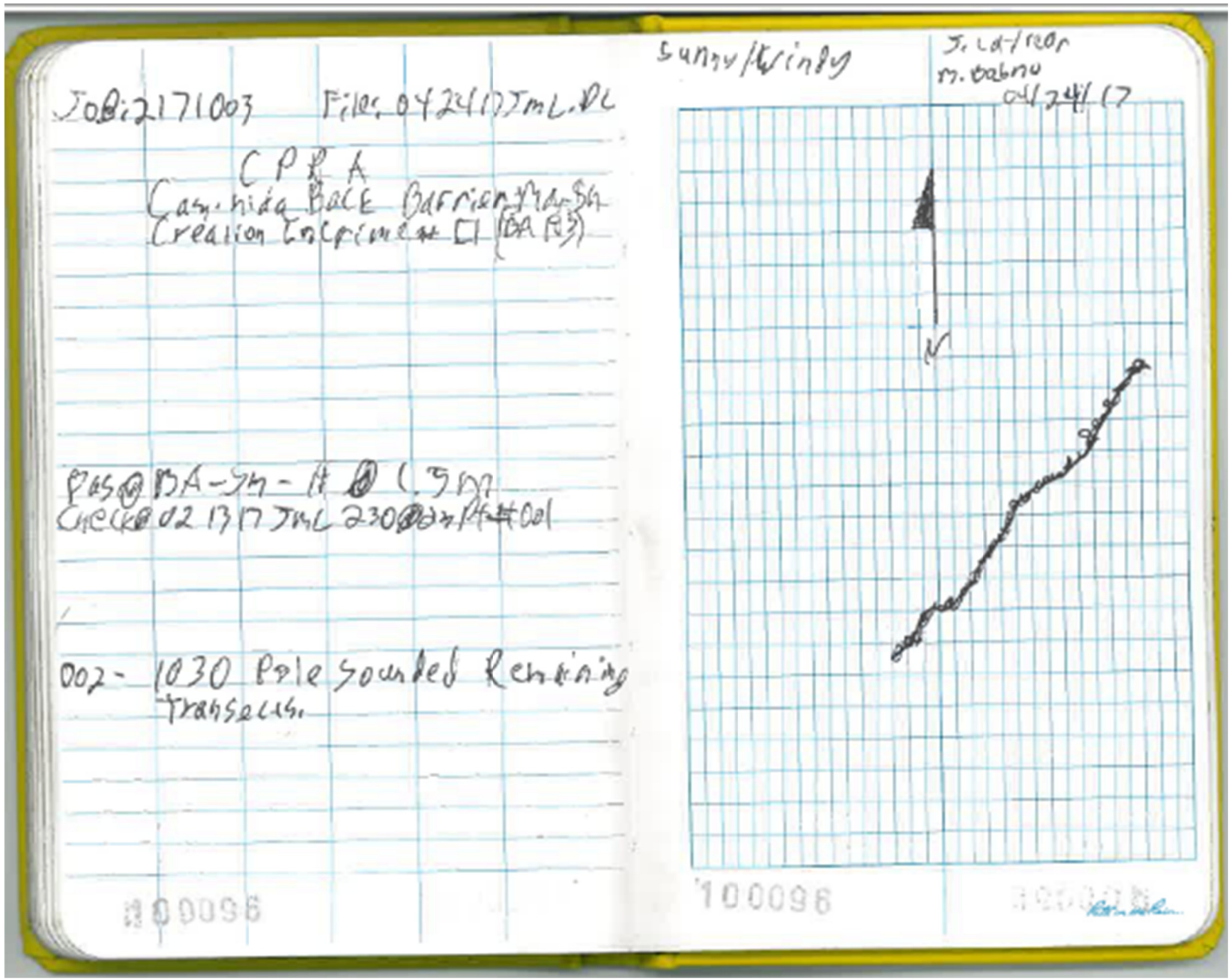

2171003
CPRA
Caminada Back Barrier Marsh Creation
Base @ TGW_SM-01 @ 1.5M
CHK @ CRMSBA-SM-19 @ ZM #1
TIED IN Top of Recorder @ ZM #2
TIED IN NAIL In Recorder @ ZM #3
water top @ ZM 4-6
TIED In Top of Post @ ZM #7
TIED In Nail @ ZM #8
TIED IN 2' mark of Tide gauge @ ZM #9
TIED IN Deep Rod Reset @ ZM #10
CHK @ CRMSBA-SM-19 @ ZM #11-12
100092
T. Roberts
M. Robinson
D. Power
Hot
windy
4-12-17
RTK
Airboat
EXHIBIT 1 & 2
N
100092


JOB: 2171003
File: 042117JMLA
CPRA
Caminada Back Barrier Marsh
Creation Increment II (BA-193)
Base @ B2 1317JMC @ 2m pt #001
Check @ BA-SM-10 @ 1.5 m
pt # 002-802 Pole Shots @
Transects
Sunny Calm
A. Boone
04/21/17
N


Job:2171003 File: 042417JmL.DL
CPRA
Caminada Back Barrier Marsh Creation Increment II (BA-193)
Pass @ BA-34-H @ 1.5kn
Check @ 02 13 17 JmL 230 @ 2kn #001
002 - 1030 Pole Sounded Remaining Transects.
100096
Sunny/Windy
J. LaFleur
M. Dabney
04/24/17
100096

APPENDIX D CRMSBA-SM-19 GEOID12A RESULTS

CRMSBA-SM-19 Geoid 12A Opus Solution				
Date	Northing (m)	Easting (m)	Ortho HT (m)	
2/7/2017	76240.063	1119877.934	0.753	
2/8/2017	76240.054	1119877.919	0.741	
2/9/2017	76240.064	1119877.924	0.741	
2/13/2017	76240.051	1119877.919	0.755	
2/14/2017	76240.046	1119877.937	0.749	
2/20/2017	76240.056	1119877.919	0.746	
2/21/2017	76240.053	1119877.920	0.755	
2/22/2017	76240.056	1119877.920	0.746	
2/23/2017	76240.052	1119877.921	0.752	
2/24/2017	76240.054	1119877.935	0.752	
3/15/2017	76240.045	1119877.932	0.740	
3/16/2017	76240.055	1119877.941	0.757	
3/20/2017	76240.061	1119877.920	0.746	
3/21/2017	76240.043	1119877.931	0.755	
3/22/2017	76240.049	1119877.936	0.745	
3/23/2017	76240.062	1119877.928	0.745	
3/27/2017	76240.064	1119877.931	0.752	
3/28/2017	76240.061	1119877.934	0.730	
3/29/2017	76240.067	1119877.931	0.746	
	76240.056	1119877.928	0.748	Mean (m) Geoid 12A
	250130.916	**3674132.835**	**2.453**	Mean (ft) Geoid 12A
	250130.910	3674132.890	3.460	Published Geoid 99
	0.006	-0.055	-1.007	Difference

APPENDIX E TOP OF WATER SURVEY

Northing	Easting	Elevation	Date and Time
251992.674	3677097.729	-0.400	2/8/2017 8:04
241388.451	3671153.148	-0.410	2/8/2017 9:42
242454.103	3670678.892	-0.480	2/8/2017 10:16
241354.481	3671807.326	-0.250	2/8/2017 11:37
242544.629	3670923.965	-0.360	2/8/2017 12:09
241505.984	3671994.103	-0.330	2/8/2017 13:01
241555.609	3672254.523	-0.290	2/8/2017 13:33
242797.685	3671350.547	-0.340	2/8/2017 14:10
241765.304	3672756.538	-0.320	2/8/2017 14:59
251997.311	3677114.545	0.120	2/8/2017 16:03
251740.127	3676439.019	-0.160	2/13/2017 9:07
243249.470	3675062.540	-0.240	2/13/2017 10:50
244957.437	3673548.818	-0.090	2/13/2017 11:47
235604.069	3664025.909	-0.400	2/13/2017 12:30
238361.733	3667928.229	-0.240	2/13/2017 13:02
251987.738	3677061.617	-0.090	2/14/2017 7:19
243767.957	3675290.110	-0.220	2/14/2017 8:28
245396.565	3674733.413	-0.050	2/14/2017 9:58
245396.500	3674733.485	-0.030	2/14/2017 9:58
245679.726	3675143.536	-0.090	2/14/2017 11:00
244393.867	3676697.105	-0.070	2/14/2017 12:11
244638.472	3676747.941	-0.150	2/14/2017 12:56
244231.121	3675686.637	-0.050	2/14/2017 13:29
249905.250	3683420.630	0.030	2/14/2017 14:39
245684.924	3676010.646	-0.150	2/20/2017 9:43
246757.425	3676543.767	-0.020	2/20/2017 11:22
247117.139	3677196.576	0.210	2/20/2017 12:46
247231.078	3677402.533	0.350	2/20/2017 13:17
247740.756	3678305.013	0.250	2/20/2017 14:36
251974.891	3676948.669	0.540	2/20/2017 15:37
251970.423	3676945.601	-0.240	2/21/2017 8:11
248341.467	3679082.865	-0.170	2/21/2017 9:12
250168.443	3674206.614	-0.210	2/21/2017 10:19
248624.864	3679490.119	0.000	2/21/2017 11:16
248624.868	3679490.105	-0.060	2/21/2017 11:16
248959.737	3679865.465	0.190	2/21/2017 13:13
249400.304	3680470.875	0.170	2/21/2017 14:49
249500.935	3680734.767	0.340	2/21/2017 15:43
251970.121	3676947.284	-0.330	2/22/2017 7:29
249892.590	3681168.880	0.130	2/22/2017 8:51

250111.897	3681488.019	0.290	2/22/2017 9:30
250457.109	3681849.540	0.130	2/22/2017 11:33
250609.888	3681942.036	0.070	2/22/2017 12:54
249521.980	3683184.269	0.140	2/22/2017 14:00
250217.040	3683525.786	-0.020	2/22/2017 15:02
251971.226	3676947.684	-0.170	2/23/2017 7:49
241808.327	3669581.095	0.010	2/23/2017 9:02
241678.336	3668872.378	-0.130	2/23/2017 10:03
241145.244	3668857.896	0.010	2/23/2017 11:25
240620.289	3668312.204	-0.030	2/23/2017 12:42
240661.630	3667910.119	0.150	2/23/2017 13:15
240116.044	3667768.905	0.130	2/23/2017 14:34
251972.343	3676945.490	-0.050	2/24/2017 6:39
239249.159	3666809.939	0.000	2/24/2017 7:49
238908.026	3666454.463	0.010	2/24/2017 9:24
238683.759	3666028.334	-0.140	2/24/2017 10:36
238458.008	3665857.846	-2.890	2/24/2017 10:47
238285.639	3665528.413	-0.060	2/24/2017 11:15
251947.490	3676841.258	0.130	2/28/2017 8:22
238032.791	3665221.728	0.250	2/28/2017 9:00
250185.108	3674231.880	0.040	2/28/2017 12:17
237669.692	3665361.183	-0.110	2/28/2017 13:16
237392.384	3664280.896	-0.290	2/28/2017 14:19
237171.605	3664004.764	-0.230	2/28/2017 15:22
250100.611	3674160.603	0.680	3/1/2017 8:27
236905.373	3663568.693	0.450	3/1/2017 9:05
236905.407	3663568.632	0.480	3/1/2017 9:05
235756.047	3662772.132	0.250	3/1/2017 10:29
237460.376	3666956.474	0.260	3/1/2017 11:45
251965.701	3676900.265	0.220	3/1/2017 12:11
251963.364	3676892.890	0.180	3/1/2017 13:20
251986.452	3677083.931	0.020	3/1/2017 14:57
241511.813	3672196.102	0.150	3/1/2017 15:53
241189.763	3672521.516	-0.060	3/2/2017 8:49
240633.180	3670150.159	-0.070	3/2/2017 10:38
247735.983	3678794.263	0.690	3/2/2017 11:22
247723.553	3678775.914	0.630	3/2/2017 12:02
247719.152	3678772.348	0.670	3/2/2017 12:03
249482.987	3680912.903	0.670	3/2/2017 12:31
247339.891	3679047.194	0.540	3/2/2017 14:07
237331.783	3665258.473	0.220	3/2/2017 15:23
250172.051	3674226.509	0.230	3/7/2017 7:47
235179.686	3662438.967	0.210	3/7/2017 9:15
235179.723	3662438.465	0.250	3/7/2017 9:15

240826.693	3669892.740	0.190	3/7/2017 10:29
242255.498	3671736.146	0.420	3/7/2017 12:44
243726.354	3673810.225	0.480	3/7/2017 14:10
245473.338	3675955.185	0.740	3/7/2017 15:46
250115.497	3674119.181	-0.420	3/8/2017 8:28
246205.817	3676905.483	0.450	3/8/2017 14:14
246909.785	3677865.024	0.300	3/8/2017 15:19
250174.249	3674229.449	-0.080	3/9/2017 8:00
249203.280	3680435.639	-0.150	3/9/2017 8:47
252931.214	3684390.797	0.310	3/9/2017 11:00
244767.009	3676463.626	-0.380	3/10/2017 9:43
244049.406	3675481.063	-0.220	3/10/2017 10:45
243381.642	3674586.228	-0.200	3/10/2017 11:47
242144.138	3672932.090	-0.220	3/10/2017 12:59
241498.838	3672052.156	-0.250	3/10/2017 13:51
239573.789	3669464.796	-0.270	3/10/2017 14:52
246577.497	3678888.212	0.300	3/15/2017 10:25
245428.104	3677329.051	0.240	3/15/2017 12:07
239033.378	3668734.358	-0.180	3/15/2017 13:05
236757.251	3665669.395	-0.030	3/15/2017 14:23
235020.487	3663321.904	0.000	3/15/2017 15:29
253019.744	3684552.635	-0.150	3/16/2017 9:08
253011.145	3684555.750	-0.040	3/16/2017 12:19
249892.543	3681137.826	-0.160	3/16/2017 14:15
251966.850	3676927.919	-0.270	3/16/2017 15:19
250114.931	3674118.925	-0.400	3/20/2017 8:57
250117.500	3674119.358	0.090	3/20/2017 12:42
250113.816	3674118.545	-0.660	3/21/2017 8:35
250118.669	3674118.695	0.280	3/21/2017 16:49
250115.730	3674118.723	-0.340	3/22/2017 9:19
251954.973	3676886.465	-0.470	3/23/2017 9:11
250115.007	3674118.012	-0.510	3/24/2017 8:21
250118.775	3674117.431	0.320	3/27/2017 8:52
250119.897	3674118.101	0.520	3/28/2017 9:07
236098.855	3662319.003	0.340	3/28/2017 10:55
235330.339	3663345.754	0.400	3/28/2017 12:51
235330.367	3663345.626	0.400	3/28/2017 12:51
250119.425	3674118.588	0.450	3/28/2017 16:15
250121.797	3674117.801	0.889	3/29/2017 8:50
235365.187	3663371.316	0.768	3/29/2017 11:24
235698.412	3662851.668	0.724	3/29/2017 12:59
235575.235	3663002.009	0.620	3/29/2017 14:04
250326.584	3683938.082	0.508	3/29/2017 15:25